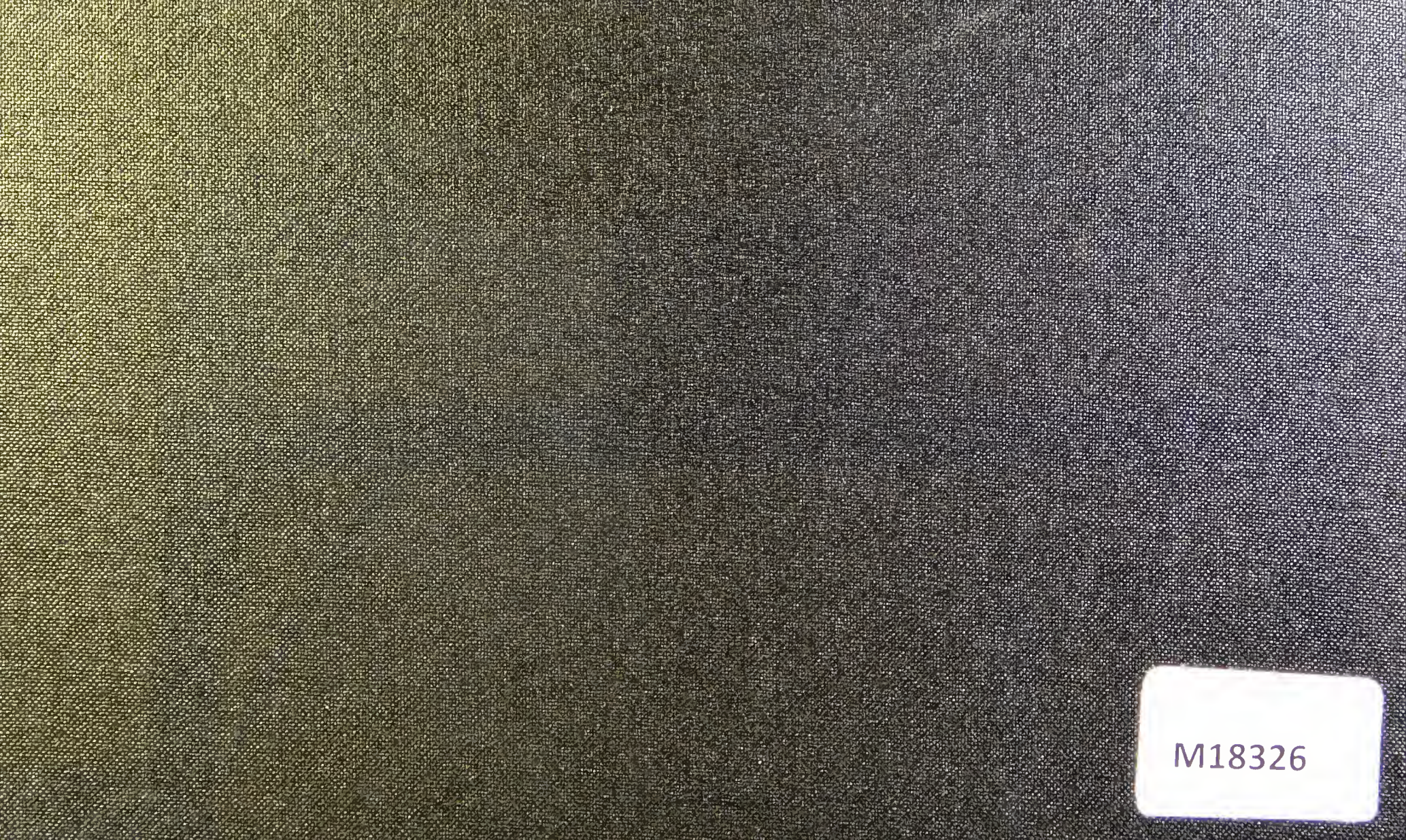
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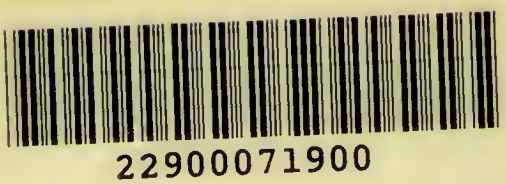
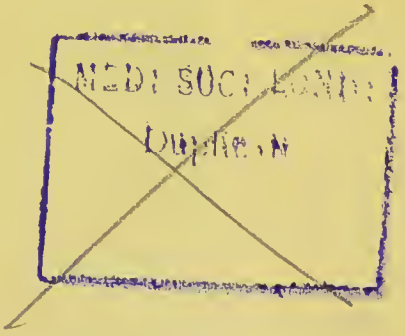


ON PHTHISIS



ON

PHTHISIS

AND THE

SUPPOSED INFLUENCE OF CLIMATE

BEING AN

Analysis of Statistics of Consumption in this part of Australia

WITH REMARKS ON THE CAUSE OF

THE INCREASE OF THAT DISEASE IN MELBOURNE

BY

WILLIAM THOMSON, F.R.C.S., F.L.S.

"The goodness of the air in places is better distinguished by experience "than by signs."—BACON, *Historia Vitæ et Mortis.*

MELBOURNE
STILLWELL AND CO.
1879

"The fact is, that at all these sanitaria, a "great amount of capital has been spent, and "the doctors and people connected with each "individual place find very good scientific "reasons for pronouncing their own locality "and elevations, the one that offers the best "conditions for chronic disease in general, and "for pulmonary disease in particular.

"These one-sided views are often, if not "generally, entertained and defended in perfect "good faith, the concentration of thought on "one locality warping the judgment. In "science, however, we must learn to make "allowance for local partiality, and try to be "guided by purely scientific reasoning."

Dr. J. Hughes Bennett, 1878.

"It is my hope and desire that it will
"contribute to the common good; that through
"it the higher physicians will somewhat raise
"their thoughts, and not devote all their
"time to common cures, nor be honoured for
"necessity only."

PREFACE.

During many voyages in medical charge of passenger ships sailing between England and various parts of the world—India, China, North and South America, the West Indies, and six several times to different ports in Australia, the author had fair means of noting the effect of sea life on health, and of early hearing about the good repute Australian climates were rapidly gaining for their supposed salutary influence, especially over phthisis.

So prepared, he entered practice here in 1854, and began that series of observations to which he now makes what he trusts may prove no unimportant addition.

Cases soon came under notice disproving a power in climate to prevent or cure phthisis, or indeed, modify any specific malady. Satisfied by clinical evidence, he was not slow to say so.

One early instance occurred in a young Tasmanian gentlewoman, in whom physical signs alone plainly denoted double pulmonary phthisis. Yet diagnosis was doubted, because the disease was held to be unknown among natives of the climatically favoured island. Autopsy, in presence of more than one medical man, revealed anfractuous cavities and vomicæ, riddling both lungs.

A reason once is a reason ever. The case foreshadowed others likely to follow, for which, indeed, one had not long to wait. Few Victorians were then old enough to test the theory; but from the older colony numbers sufficient were not wanting.

In 1857, the author wrote to the then newly inaugurated *Australian Medical Journal*, that "men of deliberation would not hesitate "to pronounce as premature any opinion as "to the influence of climate on the health "and lives of the inhabitants of a country "before it was peopled."

In the year following, 1858, Dr. Hall, of Hobart Town, wrote in the same periodical that "Tubercular Diseases" were in that

colony, "a trifle beyond the London rate;" and then added, "Scrofula is not a "Tasmanian disease; it ought not to be "in so dry and propitious a climate." These conflicting statements were hard to reconcile.

When called, in 1859, by the Medical Society of Victoria, to edit *The Australian Medical Journal*, the author placed himself in direct communication with Mr. R. Brough Smyth, of the Surveyor-General's staff, and Dr. G. Neumayer, Director of the Flagstaff Observatory, with a view to arrange about making a joint series of observations on our medical climatology, and special reports for publication in the journal, in the January number of which, for that year, appeared the first instalment of our several contributions. Before then, Mr. Smyth had himself supplied meteorological reports to the journal, so that, while Dr. Neumayer may have been "the first person to make observations on the climate of Victoria on an extensive scale," as is in the *Practitioner*, of November, 1878, claimed for him, he, noble worker though he

was, yet was not pioneer. Called to other duty, both colleagues left their coadjutor alone to fulfil the original intention. And if he regretted that "so good an argument "lighted on so poor an author"—like *Rosalind*, "not a good epilogue," he has done at least negative good by inciting abler writers to illustrate a subject abandoned apparently in despair by the Medical Society, and by the Central Board of Health wholly left untouched.

In 1870, the author gave the result of those investigations.

In the following pages will be found evidence sufficient to show that "in the time that "has since elapsed there have accumulated "materials the systematic collection and "arrangement of which would be of value;" if, indeed, they do not go far to confirm the truth of the primary proposition, that climate exerts no influence whatever over specific or contagious disease.

Those who would rather not mix practical writings with speculative subtlety, and who do not care to have topics not very agreeable

obtruded upon their attention, might well weigh these words:—"Things that are mean "or even filthy,—things which must be "introduced with an apology,—such things, "no less than the most splendid and "costly, must be admitted into natural "history. Nor is natural history polluted "thereby; for the sun enters the sewer no "less than the palace, yet takes no pollution. "That model, therefore, I follow. For what-"ever deserves to exist deserves also to be "known, for knowledge is the image of exist-"ence; and things mean and splendid exist "alike. From mean and sordid instances "there sometimes emanate excellent light and "information. Many things in this history to "common apprehension, or indeed to any "understanding accustomed to the present "system, will seem to be curiously and "unprofitably subtle. Let men be assured "of this, that all subtlety of disputation and "discourse, if not applied till after axioms "are discovered, is out of season and "preposterous; and that the true and proper, "or at any rate the chief time for subtlety

"is in weighing experience and in founding "axioms thereon."

And although these principles did not lead their enouncer to make any great discovery of fundamental truths, such as the circulation of the blood, the planetary revolutions, tidal ebb and flow, formation of dew, or the correlation of the physical forces, they yet carried him near enough to them all to enable him to point out the direct way for others; and thus the great moral catalysis "moved the intellects that moved the world," until all those natural laws were "subdued to the uses of human life." In like manner will research by these laws directed, prove the opposite of deductive or empirical systems that led to error on climate, and "by dissecting and making an anatomy of it" eventually reveal the yet unknown efficient cause of typhoid fever and phthisis, and give man empire over them by teaching him to obey the natural law of contagion.

South Yarra,
June, 1879.

ON PHTHISIS

AND THE

SUPPOSED INFLUENCE OF CLIMATE

Phthisis continues to be the most fatal disease in Victoria. "Deaths from phthisis in "1877 numbered 1088, which is a larger "number than was ever previously recorded "in any year. A greater mortality in 1876 "resulted from scarlatina, and in 1875 from "measles, than from phthisis, but these "epidemics having subsided, phthisis in 1877 "resumed its place at the head of the list of "causes of death, thus showing itself to have "been in that year, as in nearly every other, "the most destructive of all complaints. The "death-rate from phthisis in Melbourne and

"suburbs is much higher than that of the "whole colony, and increases from year to "year." (*Victorian Year Book*, 1878.)

Moreover, of all deaths occurring in the colony at ages from 20 to 35 years, 1 in 3·4 is from phthisis; while in Melbourne and suburbs of deaths at those ages 1 in 2·7 is from that disease; but in Victoria, excluding Melbourne and suburbs, the ratio is 1 in 4·4. On a former occasion the ages were taken at from 20 to 45 years, but now they are selected at from 20 to 35, the better to cover only natives of Australia.

DEATHS FROM ALL CAUSES, AND FROM PHTHISIS, AT AGES FROM 20 TO 35, IN 1877.

	Total.	From Phthisis.	Ratio.
Victoria	1235	366	1 in 3·4
Melbourne and suburbs	616	224	1 in 2·7
Victoria, excluding Melbourne and suburbs	619	142	1 in 4·4

These proportions are greater than those that were found when I wrote on the subject eight years ago, and justify every word then said. Longer experience finds the progress of the malady in this colony following in

every phase its usual course, unaltered and unmodified by climate.

An elaborate effort was made some time ago to refute this proposition, and a paper has been prepared for perusal by people living at a distance, to throw doubt on the truth of writings that have been largely cited in all parts of the world to disprove the climatic theory of phthisis. A reply to that document is due from me ; for the value of the argument can only be sustained by proof of my fidelity. That impugned, or the accuracy of my premises disputed, silence, by giving an apparently tacit acquiescence, would make what I have written appear unfounded, and no longer "an important "chapter in the natural history of the great "scourge of our race."

Among many communications encouraging me in this important social and medical inquiry I here append one from a member of the profession who long adorned the highest office a medical man in England can attain, and who is still professor of medicine in one of her old universities :—

"June 29, 1878.

"My dear Sir,—

"... I venture to congratulate you "on a really important contribution to the "ætiology of phthisis. The facts and argu- "ments have an interest and importance not "confined to the colony of Victoria. They "go far, even standing by themselves, to "establish what is, I doubt not, true, but "not yet recognised as true — that mere "climate is of infinitely less importance in "reference to phthisis than is the *air* habi- "tually breathed within the dwelling-house, "particularly when, as in in-door occupations, "the air of the house is the air in which "the person has to live. English physicians "occasionally benefit their patients by sending "them to Australia, but it is the life on "deck *during the voyage* that chiefly benefits "the phthisical patient.

"The living in small houses, and the "custom of keeping the windows closed, "have, I am sure, a potent influence in "the production of phthisis. I could not "give the weighty evidence of large statistics,

" but the fact has been impressed upon me
" many times by the (otherwise inexplicable)
" prevalence of phthisis in certain households
" or certain localities. In two villages in this
" neighbourhood phthisis is very prevalent.
" Both of them are mostly agricultural
" villages. The people have no manufacturing
" or in-door occupations ; but in both there
" is a habit of keeping the windows closed.
" In one of them the only cause I know of
" is that a clay soil and elevated situation
" make the climate rather colder than in
" other places hereabouts. In the other place
" —a large village, with a population exceed-
" ing 2000 — the custom of keeping the
" windows closed has a curious origin. The
" place was famous for its cheese, and some
" years ago 2000 cows were kept there.
" These were driven into the village twice a
" day to be milked, and in the summer
" time were accompanied by so many flies
" that the people, troubled with this plague of
" flies, shut their windows to keep them out.
" The custom once established has, more or
" less, continued, and the tendency to phthisis

" has, no doubt, been aggravated by inter-
" marriages, to which the people of this
" village are very prone.

" But all this is little better than mere
" gossip, not worthy to be sent across the
" Pacific in a letter acknowledging your really
" good work.

" Accept, however, my thanks, and excuse
" the delay in sending them.

" Very faithfully yours,

" . . . . . .

" William Thomson, Esq., &c."

The views expressed in that letter are based in good faith on the validity of my data, and I shall show that the trust is not misplaced. A private correspondent deserves this from me even more than a public reviewer, for he cannot so readily call me to account if he thinks he has been misled. In thus vindicating my former writings I shall still apply pathological data to their legitimate scientific purpose.

The want of adequate data to determine every moot point being fully admitted, it is

yet agreed that enough exist to allow any one to be fairly debated. Until after the coming census of 1881, positive certainty about an indicated freedom from or proclivity to phthisis in Australians must remain in abeyance, although conclusions have been formulated as precisely as if they were really derived from absolute information. The number who died of phthisis at certain ages is known, not the living population at those ages—actual mortality, but not breathing morbility. Deprecating rashness in me, my opponents plunge into their own dictum.

Even the approaching census hardly promises to afford full means of finally deciding any one point; for in 1881 an influx of visitors to see an exhibition will disturb the proportions of the resident population, and vitiate any conclusion drawn from them. It will, therefore, be futile to defer further discussion, as was intended, for the question will then be on no better footing, and we may as well deal now as afterwards with "approximations" that approach near enough to practical reality.

The "conclusions" argued up to by the Medical Society as opposed to mine are:—

1st. The mortality from phthisis in Victoria is little more than half of that in England.

2nd. The rate of mortality from phthisis in Victoria has been perceptibly less of late years.

3rd. That rate is especially low among persons under 15 or 20 years of age, and has been very greatly reduced between 1861 and 1871.

4th. The reduction of the mortality among young persons is to be explained by a comparative immunity among those born in the colony.

5th. The apparent increase of mortality among young adults is due to the influx of phthisical persons from abroad.

6th. The uniformity in the rate of mortality over the whole colony for a good many years, is owing to certain insanitary conditions operating especially in Melbourne, since for the rest of the colony the rate was reduced by about one-third between 1861 and 1871.

Before pointing out all that is irrelevant and wrong in these "conclusions," the Government Statist must be allowed to answer certain incidental references to the *Victorian Year Book*, and his letter is here purposely inserted.

"Office of the Government Statist,
"Melbourne, 16th January, 1877.

"My dear Sir,

"You ask me to express an opinion respecting "the *Report of the Medical Society* upon the subject of "Phthisis in Victoria, and as the Committee kindly sent "me a copy of the *Report* some time since, which I "have carefully read, I have much pleasure in doing "so.

"The Committee, it is evident, have taken great pains, "and have supplied some valuable information. I must "however confess that several of their conclusions I am "unable to agree with.

"Comparisons respecting the death-rate from phthisis "in 1861 and 1871, whether they be made in respect to "the total death-rate or the death-rate at particular ages "are, I hold, not fair; since 1861 was, with one excep- "tion (1860), the year in which the highest death-rate "from that complaint has ever been shown by the "returns; whilst 1871 was, with one exception (1868), "the year in which the returns show the lowest death- "rate from phthisis.

"It is moreover questionable whether the returns for "1861, or any year prior to it, are reliable as regards "the mortality from phthisis, for, until 1862 phthisis "was placed in the group with pneumonia, bronchitis

"and other diseases of the respiratory system, and there "is reason to believe that many doubtful cases of lung "disease were classified as phthisis. From 1862 phthisis "has been classed as a constitutional disease, and great "care has been exercised to tabulate as such no cases "except those actually returned as of 'phthisis,' or some "term equivalent to it.

"In regard to the summarised results at the end of "the *Report*, the second conclusion, affirming that the "rate of mortality from phthisis has been perceptibly "less of late years, appears to me to be not accordant "with facts. During the 15 years—1862 to 1876—respect- "ing which only reliable observations exist, the actual "rate has displayed very marked uniformity, whilst if, "as there is no reason to doubt, persons at phthisical "ages have been gradually becoming fewer in propor- "tion to the whole population, the fact of the rate not "decreasing shows it has virtually been increasing.

"With reference to the third conclusion, I believe it "will be generally conceded that arguments respecting "the fatality of phthisis based upon the alleged deaths "of children from that complaint are of little value, as "it must, to say the least of it, be doubtful whether "the disease of which such children died was true "phthisis, and comparisons between 1861 and 1871 I "have already shown to be unfair.

"The fourth conclusion is not borne out by facts. A "reference to the table at page 75 of the *Victorian* "*Year Book*, 1876-7, shows that 20 per cent. of the "deaths from phthisis which occurred in 1876 were of "Australians by birth.

"The fifth conclusion is also shown to be erroneous "by the same table. Only three per cent. of the deaths "from phthisis in 1876 were of persons who had been in the colony less than one year, whilst 89 per cent.

"had been there for more than five years, and 81 per "cent. more than ten years prior to their death.

"The sixth conclusion is based upon a comparison "between 1861 and 1871, and therefore, as I have "already shown, is of little or no value. Supposing, "however, the data to be reliable, I fail to see that the "proposition respecting the uniform rate of mortality "over the whole colony be owing to certain insanitary "conditions operating especially in Melbourne, is at all "proved.

"Yours faithfully,

"H. H. HAYTER.

"W. THOMSON, ESQ., F.R.C.S.

"South Yarra."

Having given the Government Statist his opportunity, I now proceed to state my own argument in my own way.

Compared with the total population, the mortality from phthisis, in Victoria, continued for many years very even. That evenness showed the disease increasing. The population at prone ages, 20 to 35, had decreased by 43,338 between the census of 1861 and 1871. It had multiplied not at these but at younger ages. Immigrants had grown old, no fresh arrivals filled their place, a native race had not come up, while an exodus in bad times took many to other

colonies. With the lowered number it was thought phthisis would be less; but the disease rather increased, as numbers testify.

The unlooked-for loss of 43,338 young adults was much commented on in the press, in Parliament, debating social statics, and was by me made to illustrate the medical problem of phthisis in relation to climate.

An essayist following in my wake at the Victorian Medical Society, replaced, *on paper*, the missing thousands, to set off colonial against home communities. As well might 433,338 be made to magnify inequality. The blunder reappears in Dobell's *Reports*, 1877, and may not again be let go unchallenged.

The lost 43,338 disturbed the balance by leaving a larger share of children at non-phthisical years. When deaths from phthisis to the whole population were counted, they seemed few by comparison with older countries where relative ages were normal.

But another consideration of more concern for the future of the colony is a probable immunity from or proclivity to phthisis among natives. Data for opinion are not given in

Victorian Year Books, being either overlooked or thought not worth mention. Yet facts reveal the working of an invariable law, obtaining here as everywhere, that at all sanitary stations for phthisical invalids, their own people have or acquire a phthisical tendency.

By this law a paradox daily occurs in phthisical invalids going to and from the same climate to recover from the same malady.

How climate could cause and cure identical morbid states in a breath is not yet quite theoretically understood; and certainly it is in this colony never practically exemplified. But one effect might now be explained by unalterable hereditary taint, or by specific contagion. "Young consumptive townspeople, "who emigrate to the country, and there "recover and take up their abode, generally "marry, and," says Dr. J. H. Bennet, "thus "inoculate an otherwise healthy country dis- "trict, as it were, with scrofula and consump- "tion." Sir William Jenner has also observed the same result in distant country localities. Can Melbourne have been thus inoculated?

The deaths from phthisis in Victoria for five years ending 1869, and first six months of 1870, numbered 4259, of which only 233, or 5·47 per cent., were natives. Continued inquiry through successive years gave these results :—

Table showing the total number of Deaths from Phthisis in Victoria, and the proportion of these among persons born in Australia.

Year.	Total Number of Deaths from Phthisis.	Born in Australian Colonies.	
		Number.	Percentage to total number of Deaths.
1865 1866 1867 1868 1869 1870*	4,259	233	5·47
1871	841	101	12·01
1872	876	126	14·38
1873	945	164	17·35
1874	1,011	179	17·70
1875	1,027	249	24·24
1876	1,010	193	19·11
1877	1,088	254	23·34

* First half of.

Here is a steady growth of fatal phthisis among natives, from 5·47 to 23·34 per cent., or nearly five-fold. The jump to 24·24 in 1875 will be shown due to measles, for it comes out plainly in all the various tables as they cross question one another.

The increase has to be considered along with the number of natives grown from under into phthisical years in the time. The proportion is uncertain. Roughly calculated by experts, it is thought unlikely to equal the greater phthisis rate, and the following estimates plainly indicate how far one rate is from covering the other :—

Total Numbers of Victorian-born Persons Returned at the last four Censuses.

Year of Census.	Victorian Born.		Number of years between each Census and the former one.
	Numbers. Returned.	Increase shown at each Census as compared with the former one.	
1854	29,996	—	—
1857	68,173	38,177	3
1861	138,075	69,902	4
1871	329,597	191,522	10

The total increase of persons born in Victoria during the seventeen years between 1854 and 1871 was nearly 300,000. All of these must have been born since 1854, and consequently not one could in 1871 have been more than seventeen years of age. The only Victorians who could, at the census of 1871, by any possibility have been over seventeen years of age are those—amounting to about 30,000—enumerated in 1854, and of these it is not at all likely that more than 20,000 were alive and in the colony in 1871. It is, therefore, certain that the number of Victorian-born persons at phthisical ages living in the colony in 1871 bore a very small proportion indeed to the whole number of Victorians contained in the population.

To make this part more complete the following details are added; for as a demonstration of the proofs of a progressive increase of phthisis among the native race hinges on the proportion of deaths therefrom to the numbers growing up, minute and careful calculation is required where exact numbers are unattainable.

Deaths from Phthisis, per 10,000 *persons, from* 15 *to* 35 *years of age, in Victoria in* 1861, 1871, *and* 1877.

Year.	Number of Persons Living in Victoria between 15 and 35 years of age.	Number of Deaths from Phthisis at those ages.	Number of Deaths in every 10,000 living at those ages.
1861	89,264	98	10·98
1871	103,978	126	12·12
1877	120,934	196	16·21

The years 1861 and 1871, being census years, yield exact numbers; but for 1877, the numbers of persons living at the specified ages are "estimated," and "must be taken "for what they are worth." Yet they are believed to be nearly correct, and are here employed for vital, as they are elsewhere utilized in social, statics. They show that at those ages deaths from phthisis increased from 11 per 10,000 living, to 16·21, a remarkable and suggestive increment. If those deaths were of young people coming to the colony only to die, as has been affirmed, their disease defied the invigorating sea voyage and renovating climate. The vast majority were probably native Australians.

Although the exact numbers of Victorian-born cannot yet be learned, the following is thought to be a near approach to them, as calculated at the middle of every year by deducting the estimated number of deaths and emigrations among Victorians from their number in births:—

Deaths from Phthisis of Natives of Victoria, from 1871 *to* 1878.

Year.	Estimated number of Victorians at the middle of each year.	Annual Increase of Victorians.	Deaths of Victorians from Phthisis.*	Number to every 10,000 Victorians.
1871	334,789	Census	81	2·42
1872	335,244	20,455	97	2·89
1873	375,530	20,288	129	3·43
1874	395,072	20,540	137	3·47
1875	412,662	17,590	209	5·06
1876	429,791	17,129	150	3·49
1877	447,402	17,611	197	4·40
1878	*			

* Not iucluding 77 deaths from Tuberculosis.

As supplementary to this table the next gives the numbers of deaths from phthisis of persons not born in Victoria.

Deaths from Phthisis of Persons not Natives of Victoria, from 1871 *to* 1878.

Year.	Estimated number of Persons other than Victorians at the end of each year.	Deaths of Persons not Victorians from Phthisis.	Number to every 10,000 of the non-Victorian-born population.
1871	403,936	760	18·81
1872	405,747	779	19·20
1873	404,832	816	20·15
1874	403,616	874	21·65
1875	402,372	818	20·33
1876	400,888	860	21·45
1877	402,468	883	21·94
1878			

Among Victorians there will obviously be a very much larger proportion of young children under phthisical ages than among persons other than Victorians; who, moreover, include all phthisical immigrants. This fully explains the different ratios shown in the two tables, without assuming any unknown immunity in the one section, or special proclivity in the other. The ages it is impossible to ascertain; but in a new colony only beginning to multiply

its native-born population in a geometrical ratio, it is self-evident that young children must largely outnumber young adults.

These facts demonstrate that at those ages, when ordinary causes of phthisis, effective in all other countries, come into active operation here, their action is not affected nor in any way modified by climate.

It will probably be replied that many young people from adjoining colonies have been attracted to Melbourne for employment in factories; but this will only the more prove the truth of the previous inference. Or, it may be averred that many came to town for medical advice, and remained to die.

But, in the entire absence of exact data for such an opinion, it cannot be said to rest upon a precise basis of fact; while it might be refuted by the equally tenable opinion, that many young people who come into town from the country to work in factories or go into domestic service, and there contract phthisis, return home to their relatives in the country, and so relieve the aggregate town mortality, and swell that of the country; the

one source of fallacy probably thus correcting the other, in Victoria as it has been found to do in England and in other countries.

If the apparent town mortality be swelled by people coming from the country to die in city hospitals, as is often affirmed, then relegating their cases back to the country would add to its death-rate and lower that of town, bringing both nearer an equality; but it would also nullify the argument about the greater salubrity of country air.

People coming from the country to be medically treated for phthisis, and to remain in town to die, most commonly belong to the class who seek hospital aid in sickness.

During the years 1868 and 1869 the proportion of native-born who died of phthisis in the Melbourne Hospital to the total number of deaths in that institution from the same disease was nearly 7 per cent.; in the four years ending 1874 it only rose up to 10½ per cent., a rate not at all equal to the general increase of deaths from phthisis among the general population. Data later than 1874 are not obtainable.

MELBOURNE HOSPITAL.

Return of the number of Cases of Phthisis among Victorians and other Australians, during the years 1871-72-73-74.

Year.	Natives of Victoria.		Natives of other Australian Colonies.		Total Natives of Australia.	
	Number of Cases, fatal and non-fatal.	Number of Deaths.	Number of Cases, fatal and non-fatal.	Number of Deaths.	Number of Cases, fatal and non-fatal.	Number of Deaths.
1871	13	7	13	4	26	11
1872	15	4	4	2	19	6
1873	24	15	4	4	28	19
1874	16	4	8	7	24	11
	68	30	29	17	97	47

The total number of deaths in hospital from phthisis during four years being 451, the 47 deaths among Australians is about 10½ per cent.

In offering these explanations, it is always borne in mind that they are merely conjectures of what is the probable interpretation of facts which at present form a rather ugly blur upon the social economy of a young people.

It may again be urged that the rate of phthisis fatality in Victoria is low if compared

with that for England, a truth never doubted, far less denied, though often said so by critics who would not read before they criticised, but trusted a second-hand misquoter. This error is likewise repeated in Dr. Dobell's *Reports*, 1877, the local reporter declining to rectify it after it was pointed out. What had been averred was that at certain ages "neither Melbourne nor the "whole colony seem to have any vast advan- "tage over England in this comparison." But my critics insist that all ages were included. It was also added that if things went on as they were going, phthisis would grow gradually worse, and facts now adduced go far to verify the prediction.

Formerly, Melbourne and suburbs were compared with England, because their area, ten miles in diameter, is about equally populous, phthisis being always co-related to degrees of density. Taken in these relations, Melbourne and suburbs, when compared with England, rather than with any one of its huge compactly-peopled cities, exhibits a parallel. In the more thinly-populated rural

counties of England there often is less phthisis to a given area than in sparsely-peopled Victoria or Tasmania.

The comparison was originally made at page 45 of my essay, *On Phthisis*, in 1870. In *Victorian Year Books* that comparison has been several times paraphrased. No stress was laid on mere density *per se*, but on concomitants of crowding in indoor trades and avocations carried on under conditions likely to induce or propagate phthisis. These trade defects are fully discussed from pages 55 to 66. All there remarked agrees with what Dr. William Farr has since said about "the greater "proximity of man to man the greater is "the mortality;" or Mr. A. Haviland, of the real source of phthisis in every village being from overcrowding by people "huddling "together;" or Professor Ruehle, of the "now well established fact that the frequency "of consumption increases with the density "of the population, and that, the world over, "the mortality from phthisis is greatest in "large cities, and that in these it is greatest "in most thickly populated quarters." More

of such non-climatic and purely personal influences operate in Melbourne than in the country, hence the fair comparison.

The social circumstances of a small community, few unhealthy indoor trades, little hemmed-in life, and plenty of wholesome food for everybody, have again and again been called mitigating agencies, irrespective of a dry, sunny, out-inviting, often genial, and, taken all in all, enjoyable climate.

The most important of the Medical Society's "conclusions" is that "The reduction of the "mortality among young persons is to be "explained by a comparative immunity among "those born in the colony."

The exact state of this part of the question can now be shown by the following figures, obtained from the Registrar-General, Mr. Gibbs, custodian of the data, under whose supervision they were collated for me from the general returns by Mr. Fenton, the most experienced clerk in the vital statistics department. The table would probably be found another useful addition to the next *Victorian Year Book*.

RETURN *showing the Estimated Mean Population and the number of Deaths from Phthisis in Victoria during the Years 1871 to 1877 (both inclusive), distinguishing those of Persons born in Victoria, Tasmania, the other Australasian Colonies, and Other Countries.*

Year.	Estimated Mean Population of Victoria.	Total deaths from Phthisis.	Deaths from Phthisis of persons born in				
			Victoria.	Tasmania.	Other Australian Colonies.	Total Australia.	Other Countries.
1871	738,725	841	81	7	13	101	740
1872	760,991	876	97	19	10	126	750
1873	780,362	945	129	19	16	164	781
1874	798,688	1,011	137	21	21	179	832
1875	815,034	1,027	209	15	25	249	778
1876	830,679	1,010	150	16	27	193	817
1877	849,873	1,088	197	30	27	254	834

PERCENTAGES *of these Deaths from Phthisis in the Victorian, and in the Australian born.*

Year.	Total Deaths from Phthisis in Victoria.	Percentages of Deaths from Phthisis of persons born in			
		Victoria.		All Australasia.	
		Number.	Per cent.	Number.	Per cent.
1871	841	81	9·63	101	12·01
1872	876	97	11·07	126	14·38
1873	945	129	13·65	164	17·35
1874	1,011	137	13·55	179	17·70
1875	1,027	209	20·35	249	24·24
1876	1,010	150	14·85	193	19·11
1877	1,088	197	18·11	254	23·34
1878	—	—	—	—	—

The estimated number of Victorians in the mean population is given in the table at

page 18, with which the two tables on page 26 should be compared.

The exceptional increase and break of the series of yearly increments in 1875 will presently be accounted for.

The above list only includes deaths registered as from "Consumption," "Phthisis," and "Hæmoptysis," but none from "Tuberculosis," the number of which on the return amounted to 77 of the native-born; and most medical readers will be inclined to add them as deaths from phthisis.

By the table it will be observed that in 1875 there were 249 deaths from phthisis in Victoria among the native-born. This number, it will also be observed, appears to be about 70 more than the normal average as compared with other years, before and after that date. But that notable increase, it must be remembered, followed immediately after the great diademic of measles had spent itself, leaving many cases of impaired health from chronic lung disease. That many of those deaths were due to the dregs of the measles became more than ordinarily probable

from the fact that the City Coroner, Dr. Richard Youl, an acutely observant member of the medical profession, had to call the attention of medical men to what appeared to him to be an invasion of an entirely new form of lung disease, which, because it often seemed to linger dormant for the while, and then, on some sudden exertion of the patient, to start into activity, and cause sudden unexpected death and coronial inquiry, he proposed to term "latent pneumonia." His error of etiology lay in failing to connect pathologically, and therefore causatively, the morbid anatomy of the lung as found by dissection, with the primary eruptive fever that had occurred in some instances five or six months before, just as often happens in pleuro-pneumonia of cattle. This oversight was pointed out by me at the time of the occurrence, and I now feel that my explanation of the unusual disease was the correct one, because this "*latent pneumonia*," properly so called, for it was latent, has no more been heard of since measles vanished. These deaths were added to the number of deaths

from phthisis, and so swelled the apparent list of deaths from that disease for that year of 1875, especially among the native-born, among whom measles mostly prevailed; but those deaths were properly due to measles, and had it not been for that fatal diademic the year would have shown in order with its steady increase from phthisis proper, in regular series. These extra deaths from latent lung disease left after measles seem to have been set down to phthisis chiefly in the country; for, as appears in the table, the number of deaths ascribed to phthisis in Melbourne and suburbs, was, in 1875, rather below than above an average. Probably many who were prone to phthisis died of measles pneumonia, and their deaths were in Melbourne so recorded, leaving there the number from phthisis less than usual.

The ratio of phthisis among the native-born white population rose gradually from 12 per cent. of the total deaths from phthisis in 1871, to 23 per cent. in 1877. Whether this increased ratio corresponds to the increase of native-born persons in the mean population,

or not, cannot be known before next census, 1881. Meanwhile the steady increase gives no warrant whatever to affirm that the young native-born white adult enjoys in this colony an immunity from phthisis.

Indeed, a contrary belief is strengthened by the numbers who died of phthisis in Melbourne and suburbs during the year 1878.

MELBOURNE AND SUBURBS.

Return showing the total number of deaths from Phthisis in Melbourne and Suburbs during the year 1878, *distinguishing those born in the various Australasian Colonies.*

Total Deaths from Phthisis, 1878.	Deaths from Phthisis of persons born in					
	Victoria.	New South Wales.	South Australia.	Tasmania.	New Zealand.	Total Australia, Tasmania, and New Zealand.
580	146	12	9	12	1	180

Of the 580 deaths from phthisis in Melbourne and Suburbs, 146, or 25 per cent., were of persons born in Victoria; and 180, or 31 per cent., of natives of all Australasia. These are proportions far beyond the dream of the

Medical Society, or that body never could have sanctioned publication of their report.

The annual increase of phthisis in the city and suburbs is further shown by the number of deaths of adults from all causes, and from phthisis, at ages between 20 and 35, in 1878:

DEATHS FROM ALL CAUSES, AND FROM PHTHISIS, AT AGES FROM 20 to 35, IN 1878.

	Total.	From Phthisis.	Ratio.
Melbourne and suburbs	626	234	1 in 2·6

On comparing these with the numbers on page 2, it will be observed that the total deaths rose from 616 in 1877 to 626 in 1878, while the deaths from phthisis increased from 224 in 1877 to 234 in 1878, or under each head by 10; and that the total increase was therefore due to the phthisis increment.

This great increase coincides with the rapid increase of deaths from phthisis among natives. That it cannot in any material degree be explained away by deaths of young phthisical adults coming into the colony in a dying state from abroad, will anon be demonstrated.

"In England and Wales the mortality "from phthisis in 1874 was at the rate of

"21·04, and in 1875 of 22·24 per 10,000 "persons living. In Scotland, in 1873, the "death-rate from the same complaint was 24·6 "per 10,000 living. In Ireland, during 1875, "it was 19·29, and in the previous ten years "it averaged 18·52 per 10,000 living. All "these rates are higher than those in Vic- "toria." But they equal those in Melbourne and Suburbs, as shown by the next tables.

Deaths from Phthisis per 10,000 *persons living in Victoria.*

Year.	Deaths from Phthisis.	
	Total Number.	Number per 10,000 Persons Living.
1867 ...	793	12·20
1868 ...	746	11·11
1869 ...	893	12·81
1870 ...	888	12·51
1871 ...	841	11·38
1872 ...	876	11·51
1873 ...	945	12·11
1874 ...	1,011	12·66
1875 ...	1,027	12·60
1876 ...	1,010	12·16
1877 ...	1,088	12·80
Total in 11 years	10,118	12·19

In contrast with that table is one showing the number of—

Deaths from Phthisis per 10,000 *persons living in Melbourne and Suburbs.*

Year.	Total Number of Deaths.	Number per 10,000 Persons Living.
1867 ...	376	21·56
1868 ...	379	20·83
1869 ...	454	23·87
1870 ...	448	22·49
1871 ...	461	22·08
1872 ...	421	18·69
1873 ...	478	20·51
1874 ...	531	22·04
1875 ...	525	21·46
1876 ...	555	22·46
1877 ...	570	22·74
1878 ...	580	23·10

Before explaining how these new found facts confute the old climatic theory, I shall meet an objection—frivolous, yet notable—to my proofs of the progress of phthisis among Australian natives.

The Medical Society profess to think "it "is easy to show, as has been done"—by the writer alone—"that in successive years

"there is a larger proportion of native-born "persons among those dying of phthisis; but "a mere list of that sort is valueless for the "purpose of proving a growing tendency to "phthisical disease, unless it can be shown "that the increase is greater than the "increase of native-born persons in the "population. This cannot be the case, since "the mortality among young persons, who are "now almost all native-born, has diminished. "As they advance into the ages above 20, at "which the disease becomes most fatal, they "must more rapidly constitute a larger "element in the lists of deaths from con-"sumption."

But this native element, even at fatal ages, ought not to yield so great results if they really enjoyed the alleged immunity. In them the malady must be as among inhabitants of other countries, when brought under the action of its exciting causes. The Society's admission concedes the point by begging the question. For twenty years there appeared an immunity, until Australians grew into the natural law of phthisical causation.

On entering the time of life they leave immunity behind. Nothing could be more conclusive.

And yet another effort is made to nullify the proof, by saying how "well it speaks for "the vigour of the Victorian-born portion of "the population, that in 1871 only 72 deaths "from phthisis, out of a total of 841, "occurred amongst them, whilst they formed "329,597 out of a total population of "731,528."

But why did the Medical Society halt at 1871? They were very well aware that in 1871 few native-born had reached what all admit to be the fatal age of 20 years, and know that every later year has brought more into the prone period, and therefore affording means for fair comparison. But the Medical Society did not avail themselves of that opportunity, halting where inquiry ought to have began. In December 1877, they would have been "glad to know if in 1871 there "was more phthisis in the colony than in "1876;" because they "could not get this information from Mr. Hayter." Obtaining

from me what time, trouble, and tact might have got for themselves, unfiltered through any one, they have now an opportunity of turning the desiderated data to fruitful argument, and satisfy their minds of their own error of judgment. To this end the annexed abstract of table at page 18 may contribute.

Deaths from Phthisis of Natives of Victoria, in 1871 *and* 1877, *with relative population.*

Year.	Total Population.	Native Population.	Deaths of Victorians.	Number to every 10,000 Victorians.
1871	738,725	334,789	81	2·42
1877	849,873	447,402	197	4·40

Here is a ratio all but doubled of deaths from phthisis among the native population; and rising from 10 per cent. in 1871, to 23·34 per cent. in 1877, of the total deaths from phthisis, as shown on page 14, and that too in a total death-rate from phthisis increasing from year to year.

Of the ages nothing is known, beyond able statists' conjecture that they are not likely

to cover the increase from phthisis. And although 4·40 deaths from that disease may seem a small number in 10,000 persons, it must not be forgotten that in these were a very large proportion of little-liable children.

It is also noticeable that the number 72, given by the Society, is understated, the correct number being 81. If it had been only 72 the contrast would have been greater.

To a remark about "the great immunity "of the native-born being very encouraging," it was replied, "that Dr. Hall, of Hobart "Town, had published a valuable report upon "that part of the subject."

The Tasmanian, like the Victorian, *Report*, was not on ætiology, but glorified the colony and extolled its climate. It angrily replied to my remarks, and this is my rejoinder.

Proof is here given that Tasmanian youth die phthisical in Victoria. In these fatal cases the complaint could not have been brought from England, but must have inhered, or been caught in Victoria. All the 30 Tasmanians who died of phthisis in Victoria, in 1877, were over 20 years of age. Neither Tasmanian nor Victorian

air eradicates struma; nor confers immunity from phthisis. Climate cannot alter diathesis, however that occult morbid state may be defined, or physiologically expounded; and no pathologist has yet succeeded in giving it a definition.

Hence it would not appear so easy to show, even after it has been done, as is assumed by imitative demonstrators, of whom *The Critic of Pure Reason* might say, "Men who never "think independently have nevertheless the "acuteness to discover everything, after it has "been shown them, in what was said long "since, though no one ever saw it there "before."

But it must now be evident that among Australasian youth there is, from phthisis, neither moderate mortality nor innate immunity.

ON THE EXTENT OF INDIGENOUS AND OF IMPORTED PHTHISIS

Next in importance among the Medical Society's "conclusions" is the 5th, affirming that "the apparent increase of mortality "among young adults is due to the influx "of phthisical persons from abroad."

To meet this sweeping assertion and prove it at variance with fact, the following table, similar to one given by me in 1871, is reprinted from last *Victorian Year Book*, 1877-8, merely altering for convenience by combining the numbers of the sexes into one group, instead of having them apart as in the *Victorian Year Book*.

This table shows the number who died of phthisis in Victoria, in 1877, also the duration of their illness contrasted with the length of time they had lived in the Australasian colonies :—

Deaths from Phthisis in Victoria, 1877.—Duration of Illness and Period of Residence in Australasia.

Period of Residence in Australasian Colonies.	Duration of Illness.													
	Under 1 month.	1 to 3 months.	3 to 6 months.	6 to 12 months.	Some months.	1 to 2 years.	2 to 3 years.	3 to 4 years.	4 to 5 years.	5 to 10 years.	10 yrs. and over.	Some yrs., long standing, &c.	Unknown.	Total.
Under 1 month	1	...	1	...	...	2	...	...	...	...	...	...	...	4
1 month to 6 months ...	...	1	...	1	...	1	1	...	1	...	...	...	5	10
6 months to 12 ,, ...	...	1	2	...	..	1	...	1	1	...	...	1	3	10
1 year to 2 years ...	...	...	..	3	...	4	3	...	...	...	...	...	1	11
2 years to 3 ,, ...	4	1	...	2	...	1	...	1	1	...	1	...	5	16
3 ,, 4 ,, ...	1	...	4	1	1	1	...	...	...	...	...	...	3	11
4 ,, 5 ,, ...	1	1	1	2	...	2	1	...	...	...	...	1	3	12
5 ,, 10 ,, ...	2	2	2	11	...	10	6	2	2	1	...	1	11	50
10 ,, 15 ,, ...	3	5	9	15	1	22	7	1	1	2	...	1	20	87
15 ,, 20 ,, ...	7	11	10	20	...	22	16	7	1	5	...	4	28	131
20 ,, 25 ,, ...	8	14	31	31	1	46	46	11	6	7	5	7	53	266
25 ,, and upwards ...	8	9	14	25	...	20	21	10	1	3	1	5	31	148
Not known (not Australians)	1	3	1	8	...	3	...	2	1	...	...	1	10	30
Born there	10	20	40	46	1	59	19	7	7	4	...	3	36	252
Not known (no information respecting birthplace)	...	1	1	3	...	5	3	2	...	...	...	1	34	50
Total	46	69	116	168	4	199	123	44	22	22	7	25	243	1,088

"Omitting 243 persons, respecting whom "the registers do not supply the information, "it will be observed that 403, or 48 per cent. "of the whole, died before they had been "ill a year, and that 322, or a further 38 "per cent., died after an illness of from 1 "to 3 years; also, that in the great majority "of cases the period of residence in the "colonies was of much longer standing than "the complaint, thereby proving that the "latter had been contracted in Australasia. "Thus of the 593 deaths of persons born "outside the Australasian colonies, respect- "ing which full particulars are specified, as "many as 569, or 96 per cent., contracted "the disease in Australasia, and no more "than 24, or 4 per cent., contracted it "elsewhere."

It will also be observed that of the 243 or 22 per cent. so omitted, particulars alone of duration of illness is wanting. Only 18 of them had lived less than 5 to 10 years in the colony. The remaining 225 had all been over 5 to 10 years resident. They too may have been old consumptives, a doubt of which the

climate may take the benefit ; but against the surmise is the certainty that deaths of those of whom particulars are found add no colour of probability to the conjecture.

The table showing the duration of illness in connection with the period of residence in Australasian colonies is now adopted for the first time in the *Victorian Year Book* for 1877-8. The same table showing the same points was originally published in my "*Digest, &c., &c.,*" in 1871, when the average length of residence of those who died of phthisis was ascertained to have been about 11 years, while the duration of their illness had only been about a year and a half, and nearly the same proportions obtain still.

It is gratifying to know that an official beginning has at length been made with the only means of settling a long-vexed question ; and it is to be hoped that all concerned in death-registrations may now be particular in ascertaining exact facts of residence and duration of illness in persons dying of phthisis, to enable the Statist to continue his good work. Hitherto the deputy-registrars have

been careful, the members of the medical profession being alone remiss with their part of the double duty. No doubt it is a much simpler matter to find the length of time in which any one has lived in the colony than that in which the same person may have been ill of phthisis; yet surely a near enough approximation could in most cases be reached so as not to leave nearly a fourth part undetermined.

Of travelled invalids claiming to have derived benefit from living in Australasia, clinical report tells nothing. Except a few desultory writings replying to mine, no objective study has been given to the work in purely clinical histories. The great fault found with me was that I had not detailed individual cases; but neither have my opponents. I preferred to depend upon public statistics, and they wisely follow my example. "The statistical was the "only ground-work upon which they could "satisfactorily base a report. Anything further "would be but matter of opinion," justly remarked the gentleman who presented the *Report* to the Society. That "it would not

"do to strongly recommend the climate on "the strength of any array of individually-"collected facts," was the only other sensible remark throughout the whole discussion that followed.

For many years no one in England or Australia has recounted cases proving by results the effect of residence in Victoria on phthisical people who came hither for health. Members of the profession assembled at the special meeting of the Medical Society, for the ostensible purpose of deliberating on the report of their select committee of inquiry; yet retired without taking the fine opportunity to offer a word of comment. At a critical juncture all were reserved and guarded, waiting to hear what would be said of it in England, and tacitly ratifying statements they will ere long regret to acknowledge.

One of their number lately wrote an ear-pricking letter to the *Lancet*, telling how wonderfully the climate improved his own broken health; but before the ink was hardly dry he was off to the hopefully better clime at the Cape. Of the host of phthisical

doctors who were at one time boastfully said to be working hard at practice, and the "cloud of witnesses" in divines vigorously preaching, of whom climatic enthusiasts wrote rapturously, where are they now? Have not they all succumbed to phthisis within the five years which our tables show to be the limit to the imported disease?

One Socratic arguer "would be glad to "know the number of young adults who died "after arrival from 1861 to 1871." A reply was promised "at an early day." But a year and a half have gone in wasting time, and reply has not come yet. If it were true "that phthisical persons who came to this "colony had a better chance of living than if "they staid at home," why has their coming been made to account for an "absurdly high phthisical death-rate"? The points do not agree, and the inquiry vainly hoped to have been "settled twelve years ago" will have to be resumed.

Alluding to an every-day practice in the modern climatic treatment of phthisis, Dr. J. H. Bennett, so recently as 1878, says he is

constantly advising phthisical patients to settle in Australia, but nowhere in his volume is to be found one word about the result; and we are now no better informed thereon than when his namesake, the late Professor J. Hughes Bennett, wrote eight years ago about one young person whom he had sent to Australia, but whose clinical history he had been unable to trace.

In *The Practitioner*, the therapeutic power of sea-voyaging and residence in Australian climates in phthisis receives great attention in an exhaustive series of papers on general climatology; and the author promises to give details about the mode of living suitable for phthisical invalids in this colony. And while criticism must be reserved until the advice be given, it may yet be remarked that, as Dr. Faber never resided during a single cycle of the seasons in Australia, his opinion must necessarily be to some extent deductive and conjectural. But we have already found how fallacious it is to infer what ought to be the effect on invalids from living under certain climatic conditions; where everything

about climate is minutely described, but not a word about patients.

Nor is it alone those who wrote books and papers before acquiring actual experience of the effect of residence who fall into the *à priori* error. Thus, the Registrar-General of Queensland, in the "*Vital Statistics*, 1877," after alluding to the high death-rate from phthisis in Melbourne and suburbs as equalling that of England, adds "doubtless the sudden "changes to which Victoria may be specially "subject are unfavourable to persons suffering "from pulmonary diseases, but, apart from "this, there can be no doubt that the warm "and dry Australian climate is much more "favourable to persons of consumptive habit "than most of the countries of Northern "Europe, though it is admitted that the "prevalence of phthisis in England is largely "attributable to the occupations in which "great numbers are engaged."

To these remarks it may be replied, that the last two years in Australia have been amongst the driest and warmest seasons on record, and yet both years were the most

fatal years for phthisis which Victorians have ever had; while it may be further observed, that in Melbourne and suburbs all kinds of factory, work-room, trading, and in-door life are, under a protective fiscal policy, rapidly multiplying, bringing town life to a parallel with life in England, affording another proof of the fallacy of the old climatic theory.

Of Queensland it was also said that phthisis rates at Brisbane equal those at Melbourne, or 20·6 in 10,000 living; but the Queensland *Report* itself shows, p. xxxii, only 12·35; with which the figures in the *Australian Medical Journal*, Dec. 1877, p. 375, do not agree. In sooth, in the Medical Society's *Report*, and the debate following on it, there is not one solitary reliable figure.

The result of the Medical Society's deliberations on the curabililty of phthisis may be briefly given in their naïve remark—"It is "certain that many phthisical persons claim "to have received benefit from residence in "the colony." Not clinical work, but sickly feeling, formed their opinion about ever fickle, always hopeful, unstoical phthisis!

It is popularly believed and medically affirmed that the high phthisical death-rate in Melbourne mainly comes from the place being an *entrepôt* for that class of invalids who flock to it, and too often tarry there to die. The following additional details, however, still further show the exact extent of this immigration to be quite unequal to the full explanation, and altogether opposed to the prevailing opinion of climatic theorists.

Deaths from Phthisis in 1876 *and* 1877 (*except* 143 *in the whole number* 2098, *of whom no particulars can be got*), *showing the Period of Residence in Australasia.*

Period of Residence in Australasian Colonies.	Numbers who died from Phthisis	
	Total in Two Years.	Proportion per cent.
Under 1 month ...	10	·51
1 month to 1 year ...	45	2·30
1 year to 2 years ...	29	1·49
2 years to 5 years ...	72	3·68
5 years and upwards	1354	69·26
Born there	445	22·76
Total	1955	100·00

Of 1,955 who died of phthisis in Victoria during 1876 and 1877, 445, or 23 per cent., were born in Australasia; 1,354, or 69 per cent., had resided upwards of five years; 72, or 4 per cent., upwards of two years; and only 84, or about 4 per cent., less than two years.

Even if all the 143 unnoted deaths could be added to the list of recent arrivals, that is within two years, 84 in number, which is hardly likely since the circumstances of new colonists are generally readily known, they yet would only raise the proportion to 10·8 per cent. of the total number in the two years.

That there is a fallacy in the ordinary interpretation of the high Melbourne fatality is suggested by the kind of efforts made to offer it a double explanation, first, from the insanitary conditions of the city, and secondly, from the arrival of incomers in a dying condition. If the latter reason be the true one, it would follow that the city cannot be so insalubrious to dwell in; although from the fact of these immigrants dying so frequently, Melbourne and Suburbs would not appear to

maintain their former repute of being "all in "all the best place in the world for consump- "tives, in all stages of the disease," except as a convenient spot to bring their sorrows to an end. A full analysis of the figures gives a fair idea of the operation of the two factors; and both are alike antagonistic to the belief in a climatic influence, causative or curative, being in any degree at work, leaving alone the efficient all-sufficing personal conditions in individual constitution and manner of life. Of these, many of the more active were enumerated in the original Essay and need not again be here recapitulated, agreeing as they do with the views of many of the ablest expounders of the etiology of phthisis who have since then written.

As it was never affirmed that phthisis mortality in Victoria equalled that in England, a negative was not required to be "incontrovertibly demonstrated." Such supererogatory work could only be gone about by persons unable to keep before their minds the basis of a discussion. All ever averred, and now contended for is, that in Melbourne

and Suburbs the higher rate prevails. The Medical Society frankly admit "it is not "disputed that the rate of mortality from "phthisis is considerably lower in Victoria "than in England;" and herein retract what they before alleged. In Dobell's *Report* alone is it still said, "Mr. William Thomson, of "South Yarra, has endeavoured to prove, by "the aid of statistics, 'that tubercular con-"'sumption is increasing in Victoria, and is "'as general and fatal in it as in England.'" The two reports, from the same reporter, do not agree. The sentence in turned commas cannot be got in anything I ever wrote, nor is the gist inferable. Nay, I have even been called "disingenuous" for taking a big town full of jails, hospitals, factories, taverns, theatres and iniquity, to make good a case against the colony. In literary work fair quotation is "the very pink of courtesy."

Nor were conditions of difference between town and country ignored, but held ever potent, phthisis being found less common away inland, where few work or live indoor, with ample fare for everybody.

But it was also shown that when the disease does occur inland, it passes through every phase as in town, unaffected by climate. "In "how far the climate of Victoria is such as "to contribute, along with these and other "circumstances, to the reduction of phthisis "mortality, is a much disputed point."

The writer is the only disputant. But his writings, at first contemned as polemical, are from year to year in *Victorian Year Books* well corroborated. In controverting him the Medical Society of Victoria aim to hinder credence of views "calculated to involve the "character of the climate in the opinion of "intending emigrants from Europe."

But what have members of a scientific society discussing processes of disease to do with hopes and fears of intending emigrants? The rapid growth of a new colony in a peculiar climate offered rare facility for inquiring anew into a doubtful point in phthisis etiology; and the opportunity was not to be lost through idle dread of some possible remote consequence.

Climate is the element to eliminate before bringing the phthisis factor into relief. By

the method of exclusion I have all along worked, and shall continue to do so, as the logical method of verifying inference.

If the phrase "a small population" imply a thinly peopled country, then, in density must be found the essential. Not the mere fact about people living near one another, but the way in which they do so live creates the phthisis factor. "Within certain limits there "is a definite relation between density of "population and mortality," wrote lately Dr. William Farr. And Mr. Haviland, comparing high and dry North Wales with wet Lincolnshire, to test the damp-soil theory, found in a midland county, sheltered from sea-storm, "the "real source of mischief in abundant evidence "of overcrowding, where people huddle together "for warmth or company." Packing within the home in hamlet or village, on a thinly peopled country, leads to error about density and its accompanying yet non-essential evils. As Professor Paget, of Cambridge, lately well observed, it is the kind of air within the dwelling rather than the atmosphere outside that brought on phthisis; a view ably advocated

in Dr. MacCormack's work on the effects of breathing pre-breathed air.

The greater prevalence of these faults of daily life in and around Melbourne than away in the open bush, made me compare the city with its cluster of crowded towns, and intervening country districts, with all England, in a general way. Straggling Melbourne, over sixty miles in circumference, with many of its minor towns ten miles apart, and open thinly-built fields between, cannot fairly be likened to huge London, compact New York, compressed Liverpool, or gregarious Glasgow. The attempt would be preposterous. The wider is the better criterion, and for the very reasons approved that made it selected in the essay, 1870. To the arguments then given at page 44, in favour of it, there is now nothing more to add, beyond the fact that as a testing point it is still adhered to. Indeed, it appears so fair and facile that anyone well may wonder why it was not earlier made his own. But that need be no cause of outrageous jealousy.

Had data been freely allowed me for the whole colony, as well as for the central

district, inquiry would have included bleak Ballarat, high-levelled and inland; glaring Bendigo, beyond the dividing range; and litoral Geelong, open to the sea air, yet sheltered from the "dynamic force" of southernly gales to which Melbourne is at all seasons so exposed. Thus might the potency have been singled out at those centres of industry, to find in what degree it was indoor, or climatic. By then comparing Melbourne and inland towns with wholly rural districts, later contrasts might have been obviated.

Unluckily the subject was not popular. Under an entirely mistaken idea of the purpose of the inquiry, the investigation was, by the minister of the day, limited to the metropolis. "State archives were not to be let settle a "doctor's squabble." The plea held good until an order in Parliament overcame objection.

Thus was I on one hand accused of a sinister motive in asking for statistics of the whole colony; and on the other, by thoughtless critics, roundly abused for "disingenuously "confining research to workshops, jails, and "hospitals, the better to make good a specious

"argument" against climate and colony. Nay a charge was even levelled in a religious journal at the writer for having "written a "book to curse his enemies." The reverend critic forgot that every effort to stay disease or heal the sick has a divine warrant; and that the Great Physician himself had to rebuke the Pharisee hindering clinical work.

It is little wonderful, therefore, to find speakers at the Medical Society, when espousing the non-climatic view, protesting against being thought disparaging the colony. Consciousness of truth needs no apology. Of unadorned utterances about "manipulated figures," "dis-"paraging slanders on the colony," and other magniloquent *bêtise* in unsophisticated debate, no more need be said than this, in reply to one remark about a "theory invented first, "and then facts made to square with it," that the facts now adduced must convince the curt doubter, who cuts debate by a quip, of their being genuine, found ready to hand, needing no touch of artful chiseling, gathered and told neither to entice nor deter invalids, nor abet any other pious fraud, but only to

learn whether climate did or did not affect phthisis. The query was novel, and "by no "means in consonance with the general "experience of medical men;" yet it was none the less open to inductive proof, by "statistics bearing incontrovertible evidence of "truthfulness and correctness," such as mine now bear, and always have borne.

Towards verifying them the Medical Society of Victoria largely contribute by steady encouragement of opposition. By this continual friction, truth has been keenly tempered to drill through dense stolidity, until that medical Mimir's Well, the strong-room of the Registrar-General, has been tapped to allow a free flow of pent-up vital facts illustrative of the negative effect of climate on phthisis.

Moreover, a department has thus been educated to appreciate the live value of buried documents, in making the dead give life to the living; and learn how figures that are dormant when kept in a heap, can, when spread about, fertilise the field of medical knowledge. Coin and blood globules are only useful in circulating currents.

Whatever success has been thus achieved is due to varying degrees of phthisis found in town and country. Than the authors cited, none are better qualified by special study to offer an opinion on the effect of large-town life on phthisis; and I adhere to a mode of working out the problem by methods so corroborated. Ruehle followed Niemeyer, who recalled the neglected work of Addison, and the inflammatory doctrine, now, in opposition to their formerly believed diathetic of Lænnec, adopted by our local etiologists, after reading works written since I drew for them the offending comparison.

In adopting the crowding criterion, I am further justified by everyone now allowing the phthisical mortality of Melbourne to be on a par with that of England, an admission unaffected by the explanation that "some "exceptional circumstances must have come "into play to bring about such an absurdly "high figure." It is sagely averred that "if exceptional circumstances were absent," colonial town-life would be more natural. The same might be equally predicated of the

bad parts of England, and her hospital towns, where invalids congregate. If exceptional circumstance went to the bush, and built a few big trading towns and villages crowded with indoor workers, there would phthisis follow. Melbourne once was bush, and at the happy time was free from exceptional circumstance and phthisis. The *reductio ad absurdum* seems the only way to reach fatuity writing nonsense about an "absurdly high figure," when alluding to a death-rate, as if it were a comicality. It needs no philosophy to teach how everywhere "the exceptional circumstance," *i.e.*, the insanitary condition of life, personal or social, makes all the difference between healthy and sickly towns in diseases not endemic, to which category phthisis does not belong. When conditions work, climate cannot counteract them.

Many have written about the evil effect of damp soil in other towns; but none have explored the piled cottages at lake-like villages around Melbourne. Whether they give more phthisis than higher and drier built dwellings is unknown, because never investigated. They

are occupied by indoor workers. By them, the damp-soil theory has not been tested. Only in a credulous dilettanti fashion, not in a practical way, has that favourite theory been here discussed.

Here then are all the facts of our urban life "quite in accordance with the general "law which obtains throughout the country "(England), viz., that however excellent site, "soil, elevation, and climate may be, all can "be neutralised by crowding human beings "into an inadequate space, and giving full "scope to indulge in their hereditary or "acquired fondness for filth."

In further deciding that phthisis depends on social rather than climatic causes, Mr. Haviland, in the *Geography of Phthisis*, &c., 1875, concludes, "The climate, therefore, *per* "*se*, cannot be considered an exciting cause, "however greatly predisposed to phthisis the "people may be."

Therein the ablest medical topographer in England has come, by minute induction, to affirm the proposition with which our local controversy over ten years ago began. With

that citation it might now be allowed handsomely to conclude.

The exceptional circumstances of individual and social life in England or Australia alike operate to induce phthisis irrespective of climate.

But damp-soil theorists were not content to advocate their views by borrowed illustrations, rather than from facts lying before their own doors. They set off their hypothesis by the contrast of an alleged immunity from the disease among people living at high altitudes; and inferred that such localities would therefore prove good sanatoria for our own consumptives. Even Baron von Mueller has been led away by enthusiasm for fragrant gum tree foliage to advocate the reservation of eucalypti-clad hills as sanitarian retreats for invalids made phthisical by Melbourne "exceptional conditions." The learned *savant* never proved the efficacy of the balmy air by actual trial, but merely thought that might occur by what was said to have happened on the pine-clad hills of Switzerland. But if the latter effect has been illusory, the analogy

would also fail. Upon this point the following account of the latest investigations of the matter will afford for us some applicable information. The citation is from Dr. J. H. Bennett, *On Consumption*, 1878.

"In the course of my summer's researches," says Dr. Bennett, "I met with a recently "published and very interesting work by Dr. "Emil Muller, of Winterthur, entitled, *Der* "*Verbreitung der Lungenschwindsucht in der* "*Schweiz*, 1876. It is principally statistical, "and gives an elaborate account of the "mortality from Phthisis in Switzerland "generally. Amongst the tables at the end "are a series giving the average mortality "from Phthisis at different mountain eleva- "tions, calculated on data furnished by a "considerable number of localities.

"The average mortality at different eleva- "tions is given in three heads:—1. In persons "whose occupations were purely industrial, "principally watch and lace making, entailing "confinement in workshops or at home; "2. In persons whose occupations were partly "industrial, partly agricultural; 3. In persons

"whose occupations were purely agricultural.
"I here give a digest of Table XVI. :—

Average Mortality from Phthisis in the Mountain Regions of Switzerland.

	Elevation.	Feet.	Occupation.	
1.	From	200	Industrial	10·2 per cent.
	To	1600	Mixed	7·6 ,,
			Agricultural	6 ,,
2.	From	1600	Industrial	10·2 ,,
	To	2300	Mixed	5·9 ,,
			Agricultural	5·3 ,,
3.	From	2300	Industrial	4·7 ,,
	To	3000	Mixed	9·6 ,,
			Agricultural	2·9 ,,
4.	From	3000	Industrial	6·5 ,,
	To	3400	Mixed	6·1 ,,
			Agricultural	3·5 ,,
5.	From	3400	Industrial	9·8 ,,
	To	4400	Mixed	7·5 ,,
			Agricultural	5 ,,
6.	From	4400	Mixed	7·7 ,,
	To	5000		
7.	Above	5000	Agricultural	4 ,,

"These tables are very instructive, and "entirely negative the statements so often "made of late years, that there is any special "immunity from Phthisis in the mountain "regions of Switzerland. They show that a "certain proportion of the general population "in the higher mountain regions die, as else-

"where, from Phthisis, the rate depending on "occupations in life. Industrial pursuits, "carried on indoors, in consequence, give a "death-rate of 10·2, 10·2, 4·7, 6·5, 9·8, 7·7 "per cent., according, no doubt, to the nature "of the occupation. One of the highest "factors, 9·8, is at an elevation of from 3400 "to 4400 feet. At 4400 to 5000 feet, in "mixed labour (partly workshop, partly agri- "cultural), the death-rate from Phthisis is 7·7." Dr. Bennett, as we ought to do, adds:—

"This is the lesson we learn in the plains, "in all latitudes, in the north as well as in "the south. The mortality of phthisis rises "in cities in all pursuits necessitating an "indoor life—that is, with those with whom "respiration is defective, with whom oxygen "food is deficient. It rises according to "the degree of closeness and to the nature "of the concomitants. It falls in the country, "in pursuits carried out in the open air, with "perfect physiological respiration; would fall "still more were not the night habitations "generally close and unhealthy, even in the "country."

All this accords with and confirms every word spoken or written by me during the last quarter of a century about the fancied influence of Victorian climates over phthisis. The so-called exceptional circumstance of city life has profusely furnished proofs of the accuracy of my early and lately expressed views, founded as they were upon strangely neglected facts.

Of Dr. Hermann Weber's work on the effect of Alpine regions in that disease, the late Professor Parkes, in the best book on hygiene ever published, says :—"Although on "the Alps, phthisis is arrested in strangers, "in many places the Swiss women on the "lower heights suffer greatly from it ; the "cause is a social one ; the women employed "in making embroidery congregate all day in "small, ill-ventilated, low rooms, where they "are often obliged to be in a constrained "position ; their food is poor in quality. "Scrofula is very common. The men, who "live an open air life, are exempt ; therefore, "in the very place where strangers are "getting well of phthisis, the natives die

"from it—another instance that we must "look to local conditions and social habits "for the great cause of phthisis. It would "even seem possible that, after all, it is not "indeed elevation and rarefaction of air, but "simply plenty of fresh air and exercise, "which are the great agents in the cure of "phthisis." The latter is probably the truer account. *Practical Hygiene*, 1878, p. 440.

In the same volume, the author, writing on varying degrees of phthisis among troops, asks, "what are the causes of this phthisical "excess? The phthisis was not owing to "climate, for that is unchanged. There is "only one condition common to all which "seems capable of explaining it—overcrowding. "The breathing the foul barrack atmosphere "was the principal, perhaps the only, cause "of this great mortality from lung diseases."

To that conclusion it is added, "The "production of phthisis from impure air (aided "most potently, as it often is, by coincident "conditions of want of exercise, want of "good food, and excessive work) is no new "doctrine."

In Melbourne and its suburbs the old doctrine only finds new application.

It would hence appear inverting the order of procedure to form a sanatorium on some eucalypti covered hill for lungs diseased by town "exceptional circumstance." It places curative before preventive treatment; the medical in lieu of the hygienic; but it also admits the existence of phthisis, which was denied. Explanation implies confession.

A more rational scheme, from a sanitary rather than a medical point of view, would aim to alter the exceptional conditions of town life, so fertile in phthisis causation. When these conditions are found irremovable, invalids may be invited to seek healing eucalyptine vapour; if indeed that benign effluence be not after all found no better than another *idolum specus*, or laboratory phantom. As far as information guides judgment, the effect is a myth. Under evergreen exhaling boughs in the native forest superstition is less fervid than with credulous Spanish peasant wearing a leaflet on the neck. Unless charms be more effective than reality,

both are alike impotent against typhoid fever, or phthisis. The wide running roots of a tree, so greedy of moisture, may drink a marsh dry and thus check the growth of algæ that are supposed to form ague malaria ; but against the other two diseases named, so common here, and arising from so entirely different causes, every day experience proves the agreeable aroma of the gum tree worthless.

On all these matters the most concerned laity are as sorry theorists as are medical advocates of popular etiology. Neither go round the subject, but quietly look on the sunny side.

Climate none can modify for personal wants ; but, while deprecating utopian schemes for impracticable cities of Hygieia, urging a clearer knowledge of individual errors that in aggregate swell a death rate, must better regulate their removal, and make healthy life possible for everybody. Ordinary toilers in a metropolis aiming to become the workshop of a continent might well be taught how it is not the handicraft nor the desk work, but the way in which they are conducted, that

brings into play the active agent in phthisis. Nor is it valid argument to affirm that a general immunity from inflammatory affections of the lungs denotes a like freedom from phthisis, seeing how the former often prevails in inverse ratio to the latter.

Whatever the "something," hitherto eluding aided or unaided vision, or pathological imagination, that makes pneumonia tend in one person more than in another, or indeed in some people not at all, to end in phthisis, may be, it is at any rate gratifying to find a growing opinion in favour of viewing phthisis often as a sequel of former lesions than always a primary systemic or pulmonary morbid state. When first that opinion was offered here the writer was invidiously reviewed as "one of those who applied the term phthisis "to a group of secondary pathological states," and not merely to a certain result of prolonged errors of nutrition. Reaction favours the more thorough, though at one period thought peculiar, etiology.

But when it is said to be "now recognised "that most cases of phthisis represent really

"the final stage of some acute inflammatory "affection, generally pneumonia," a more definite statement might be added, of the kind of pneumonia that is prone to that termination. A medical society discussing a purely pathological topic need not fear to employ appropriate technicality, without which it is indeed impossible to proceed free from periphrase or ambiguity; and more particularly in framing a *Report* ostensibly intended for scientific readers, rather than for popular perusal.

If, then, it be neither the atmosphere over the roof, nor the ground under the foundation, but altogether air within the domicile that contains the efficient cause of phthisis, the potent agent is so far brought nearer ultimate analysis. Let us therefore try to follow to its lair this hiding evil, in croupous or catarrhal pneumonia, imperfect physiological respiration, scrofula, impaired nutrition, or other malady or defect with which it is usually coupled.

Without adding a word more than need be on the relations which pneumonia, bronchitis, and tubercle bear to phthisis, a remark

may here be offered on the nature of the infecting particle, now admitted to be the special irritant, carried along lymphatic canals from deposits in the lungs or other parts of the body to set up morbid action within the air chambers that end in that disease.

In his recent lectures, Dr. J. Henry Green describes nodules as formed by epithelium accumulated within the alveoli, and containing cells resembling leucocytes, and granular or amorphous material, but he cannot speak with certainty of their exact nature. Of the "circumstances that tend to make an inflam-"matory product infective, we are at present "ignorant. They may possibly be connected "with atmospheric influences, or with certain "undefined conditions of the organism."

In incertitude speculation seemed allowable; hence my venture to conjecture how a nodule may be formed within an air vesicle by compact debris of epithelium left there after it had been blighted by being deprived of its protoplasm by the action of micrococci, in which case the giant cells and other constituents would be relics and not

products by increased cell growth. To that view nothing in Dr. Green's description is contradictory. On the contrary, it agrees with the progressive character assigned by that eminent pathologist to true phthisis.

Generally, the changes met with in the lungs in pulmonary phthisis are essentially similar histologically to those which occur in acute miliary tuberculosis, an admittedly infective disease.

May not their analogy go further, and accept phthisis as equally infective? In phthisis, as in tuberculosis, the large nucleated elements in the alveoli are evidently the offspring of the epithelial cells which line the alveolar cavities, and they, too, are always associated with granular material and leucocytes. These contents of the air chamber are accompanied by infiltration of the alveolar wall, a change in its adenoid tissue probably induced in the first instance by the irritant or infective particle acting on the protoplasm of the epithelium of the air vesicle; rather than in inter-alveolar tissue, as was until lately held by many eminent pathologists.

Here, then, there so far appears to be a connected series of morbid actions all directly connected with specific infection; and the question will naturally arise, can they be traced a step even further back? Dr. Green says, "In describing the several lesions as "inflammatory, I would again repeat that I "merely mean to imply that they owe their "origin to *some kind* of injurious irritation of "the pulmonary tissues." When infection becomes an auxiliary in the production of phthisical consolidation of the lungs, "the "infective particles are usually derived from "some pre-existing phthisical disease." All phthisis is inflammatory, but to apply the term "pneumonic," tends, Dr. Greens adds, to mislead.

The pneumonia preceding or accompanying phthisis would therefore appear to have a special feature, allied to tuberculosis. Is not the differentiating element a micrococcus? or some form of fungaceous organism endowed with special pathogenic property? And if tubercular virus, or phthisical material, be thus transferable from one locality to

another within the same body, may it not likewise be transferable from one body to another through the atmosphere ?

This transference of infecting particles is the mode of communicating phthisis most obvious with present means of judging. Virus conveyed from a diseased to a healthy lung sets up therein the irritation and inflammation peculiar to phthisis. Whether catarrh can cause phthisis in absence of predisposition, weakness of lung, or diathesis, is with many a matter of doubt, as is also the question whether physical states of respired air, arising from mere cold and damp, can thus act on respiratory organs irrespective of proclivity. But connected with the inflammatory theory one thing cannot be lost sight of in the statistics of phthisis among young adults in this colony. It has been shown that the disease is most fatal about the twentieth year. Now Niemeyer, reviver of the new favourite doctrine, states that the pneumonia apt to run into phthisis "does not occur usually, even in "delicate and vulnerable persons, before the "age at which pulmonary diseases generally

"become more frequent; and it then takes "the place of those inflammatory diseases of "other organs which have prevailed during "the preceding period of life."

This peculiarity may give a clue to the cause of the sudden increase of phthisis in native Australians approaching maturity. The tax on vital energy, when hope or fear at the outset of life come in conflict, may be too great for the inherent stamina. Or there may be unusual exposure to inhalation of specific virus. If phthisis were caused by cold and damp in ill-drained towns, they might be expected to affect all ages. But the disease does not appear to be induced by mere cold or damp in absence of that special irritant already mentioned. The crowding or huddling young folks together in sleeping-rooms and work-rooms facilitates the process of transferring virus, very much as children catch ringworm. Nobody would hesitate to separate a ringwormy head from other heads; but who amongst us would dream of excluding a lung loaded with infecting irritant particles—*micrococci*—in the blighted epithelium of

diseased air vesicles? Nobody would be so infatuated, absurd, hard-hearted, and theoretically cruel. And yet an analogue of that worm, infecting irritant particle, or organism, at havoc on the mucous lining of the air vesicle, filling and packing the alveoli with dead epithelial scales that cannot escape through the narrow necks of the *infundibula* into the bronchi as readily as they melt in benign inflammatory catarrh, having no infecting particle, is now believed on good pathological evidence to be as effectively at work, and as communicable as is the irritant that sets going the peculiar irritation in the protoplasm of epithelium on the outer skin. The latter can easily be seen under very ordinary magnifying power, as a minute creeping plant; but the devastating organism in the air vesicle has not yet been as clearly defined, if, indeed, the real mischief worker be not here, as in some other infectious diseases, beyond the visible limit. Yet it can be detected through its effect. Its existence may be matter of inference; but the result produced cannot be equalled by any common

inflammatory action. That much is certain. The means of preventing ordinary catarrh, or inflammation, call it catarrhal, or lobular, or broncho-pneumonia, or what you will, do not suffice to check the action of special irritant or infective particle inducing phthisis.

Hence, all general conclusions drawn from the presence or absence of common inflammatory lung affections from seasonal changes are utterly fallacious when applied in *a priori* reasoning about the ætiology of phthisis.

The infective agent in phthisis and tuberculosis has been oft referred to by Dr. Green, and many other leading pathologists; but none have till lately given it a name. In conjecturing what it may be like, or belong to, one may be over-bold; but yet the blank in pathological knowledge is at least open to a venture. Should conjecture prove true, the result will be of infinite practical value. It will explain many points hitherto veiled in doubt. Thus, no physiological reason has yet been given, though many efforts have been made to show why the upper lobe, or apex, of the lung is most liable to attack. And yet,

if infection depend on inhaling an irritant particle, it is clear that the air vesicles most readily reached will be most exposed to contagion. The air vesicles are carefully protected by the columnar epithelium of the minuter bronchioles hindering entrance of the smallest body; but yet, if under relaxed state of the general system, the respiratory movement is carried on in an atmosphere laden with exuviæ from phthisical lungs, inhalation of their infective material and inoculation therewith, will readily take place; when the rest of the process may be left to morbid nature.

These considerations lead to an idea of the true basis for a pathological classification of cases of phthisis into real and simulative, the latter arising from inhalation of merely mechanically irritating particles of dust, as in iron grinders, potters, colliers, cabinetmakers, and the like, in whom the disease readily subsides on removal of the mechanical cause; while the former, or true phthisis, comes alone from inhaled organisms that propagate themselves in the living tissues, and so cause the

caseating alveolar changes to become progressive. Their secondary effect include cell infiltration within the alveolar walls, condensation of connective tissue, vascular obliteration, and other changes only made known within the last few years by the morbid anatomist.

This may appear mere speculative writing; but it is all important for the question under consideration. That conjecture is warranted is admitted by the best example. In his latest contribution, 1878, Dr. Green, alluding to phthisis as *par excellence* an apex disease, frankly admits, in reference to the reason why it is so, that "our knowledge on the subject "is undoubtedly most incomplete;" while in the work on morbid anatomy of the same year, it is but conjectured that the infective agent may be a "minute organism." Such a body would necessarily exert a very different influence from a merely mechanical irritant, behaving rather in the manner of a *contagium vivum*, or septic organism.

Hence it would follow that in explaining the necessity for free ventilation wherever human beings gather, it will not be enough to

expatiate upon the need of renewal of air to replace that vitiated, or rather deprived of its vital part by previous respiration; but it must be still more important to point out that in breathing pre-breathed air there is always the probability of inhaling the specific organisms of true pulmonary phthisis; and if so, then all idea about climate conferring an immunity would become the most pernicious doctrine that could be inculcated.

That specious delusion would be all the more dangerous, unless it could be shown that any condition of ordinary air would be capable of oxidising or destroying those particles while they are active within the pulmonary alveoli, or in the outer air, after they have been exhaled, or otherwise extruded from the lungs; but of the existence of such a quality in common air there exists no proof whatever. The vitality of these hypothetical, because invisible, infective particles in phthisis, external to their bodily nidus, may be equal to that belonging to typhoid contagium, whether the latter be in form of a spherule of protoplasm, or in micrococci

therewith associated. Of this contagium, recent experiments by Dr. Letzerich, showed these organisms invariably multiplying in protoplastic spherules; but it remained undecided whether the virulent power resided in the protoplasm or in the associated organisms. The difference is not immaterial, but important, because if it be in the former, then any chemical capable of altering the constitution of hyaline would neutralize the virus, while if it be in the latter, it would, to do this, require an agent able to kill micrococci, a point to be better decided by actual clinical work than by laboratory experiment. The researches of Letzerich go far to confirm the view taken of typhoid virus in a recent publication by the author on that fever; and it in turn may probably throw a glimmer of theoretical as well as practical light on the specific contagium in phthisis.

That against either contagium peroxide of hydrogen, or gum tree aroma, are inert, we have in this colony abundant proof, though phthisis virus might perhaps be destructible

under some special atmosphere, such as that of the Solfatara, which is largely charged with sulphuric acid and arsenic, or that near New Zealand geysers, said to contain chemical compounds from volcanic vapour.

The air filled with sulpho-arsenical fumes rising from the half-extinct crater of the Solfatara at Pozzuoli, lately found effective in treating phthisis, by Dr. Franza, and other Neapolitan physicians, is supposed to exert a special local as well as a general tonic and alterative action. But the nature of the local effect is not explained. When more minutely examined it may be ascertained to be destructive of organic particles, acting on air vesicle epithelium in the manner already described; the impaired nutrition leading to mineral inanition, particularly in various phosphates so characteristic of wasting, and to repair of which principal schemes of treatment have been hitherto directed, being, like loss of fat, a secondary and dependent process, following the primary infective local inoculation.

Nicotine fumes in tobacco factories have a similar curative power over phthisis, and by

an action that must also be of a purely local character. The vapour from the leaf being uniformly diffused throughout the works, when a phthisical person enters the medicated air the nervous system usually soon becomes inured to the narcotic, but not so lung and other parasitic organisms, which quickly succumb and leave the body they infest to regain normal life. Such appears to be the rationale of cure. That recovery does occur is beyond doubt. The fact is attested in factories in this city, and has been observed in other countries; but the action has never heretofore, as far as the writer is aware, been ascribed to a germicidal property in the drug. The nearest approach to the idea is where contagium particles in other specific fevers are described as either epithelium cells or pus corpuscles adhering thereto; but even that explanation has not been extended to phthisis. That this malady may be propagated by epithelium cells dried to dust and inhaled, is no new doctrine; the only novelty being in the endeavour to follow the mode of action of specific infective particles. Whether it may

prove true or not, it at all events points to an elucidation of what otherwise remains in absolute obscurity. That "any pus or epi- "thelium cell, or even formless organic sub- "stance, floating in the air, may, if it find a "proper place or nidus in or on which it can "be received, communicate its own action, "and thus act as a true contagium," may be eventually found true ; but the analogy from smallpox virus, in the form of epithelium cells and pus globules, vaccine, &c., do not at present lend a tangible support to the conjecture. Neither do the facts observed here regarding phthisis, which, equally with other specific diseases, appears to require for its inception the direct action of its own derived specific contagium. To avoid any appearance of didactic or dogmatic assertion, very full particulars are here adduced from which is deduced the opinion.

Any power exerted by such a special atmosphere over pulmonary phthisis can be best explained by inferring the action to be germicidal over some animal or vegetable organism, or alterative of protoplasm oper-

ating in the affected tissues as a destructive self-multiplying irritant. Whether such a virulent condition of protoplasm can ever result from common non-specific inflammatory processes, or not, is a question not yet determined by pathology; but clinical observers find it daily becoming more and more evident that every instance of specific disease had its prior infecting case, no one of them ever "being as a plant which comes from "the lust of the earth, without a formal seed," as Bacon once, and many theorists since, argued. That every specific disease, like every living thing, had at one time a beginning is very true; but, when? must remain in the realm of transcendental etiology. In physic, as in farming, men go by what they know, that being of positive science the very essence.

Speculating in this recondite region of etiology, while practically teaching modes of cure and laws of prevention, Professor Billroth has again declared in the *Pathology*, 1879, a belief that organic germs, in lifeless dust or living molecule, of animal or vegetable nature,

are not always the same, and do not all alike possess phlogogenous action, but only those that are formed in certain products of inflammation; that we know nothing of them except through the inflammation they excite; and although they cannot enter the system except through a breach of surface, they yet may fall as dust from the air of a sick room or ward upon and irritate granulating wounds, which, though not absorbing surfaces to admit germs into the circulation, are covered with young cells full of protoplasm. The same germ dust may, it is added, enter the lungs in breathing; but if so, germs could not pass by absorption into the circulation through the pulmonary membrane; nor reach beyond the air vesicles. There being detained, if they had any special irritant action at all, it would necessarily be exerted on the raw protoplasm of the nascent epithelial cell, in a manner similar to the action on traumatic granulations; when the result would be the beginning of phthisical irritation, precisely as the irritant on a granulating wound would begin surgical

fever. The analogy is complete in all but this, that from the surface wound the results of irritation readily and freely flow away in the form of purulent matter, whereas, within the narrow air crypt, they collect in compact masses, and there remain to undergo necrobiotic decay, when micrococci breed from their own germs in the animal matter as maggots breed in putrid flesh, neither maggot nor micrococcus being the real irritant, but that alone which they consume, and in consuming render inert—namely, the new inflammatory product before "decay's effacing finger" re-models it into a newer form or phase of living matter. This is the idea inculcated by the writer for many years, long ere germ theories about "death's household worms" became familiar in the mouth as household words. But the "wild theorist" of that olden time has become the "follower" of his own disciple. Happy he, who, in London or Vienna, can propound a novel thought, which in Melbourne air either will not kindly germinate, or, if it should, is by broughamic critics crushed in

the braird. Thus were earlier "wild thoughts" on phthisis and typhoid rudely trodden; but in this more genial time the beaten blades revive and grow stronger for the trampling.

That the organisms, or infective particles, act on epithelium within the air-chamber rather than on that in the ultimate bronchiole, is probably explicable by the anatomical character of the alveolar epithelium being nearer allied to endothelium of serous membrane, than to the columnar form on a mucous surface, while they will there, moreover, meet with adenoid or lymphatic glandular tissue peculiar to every other pathological requirement. These distinctions are clearly indicated in recent papers in the *Practitioner*, on pulmonary pathology, by Dr. Hamilton, whose views on the intra-alveolar origin of tubercle, by accumulated epithelial scales, were given some time ago in the same journal, shortly after the author offered similar views here. Dr. Hamilton explained the accumulation by a proliferation, rather than as a relic, as the author did, and

the point is still in doubt. But, in acute bronchitis, after the older epithelium has desquamated, basement scales in the finer or ultimate branches of the bronchi do not appear to proliferate; and, as these scales are continuous with the layer of pavement epithelium of the air vesicle, the same may apply to it.

But, whether there be such proliferation or not, from the nuclei of formed epithelium, which seems to be probable, it is becoming clear, that the giant cells are only ordinary old worn out epithelial cells cemented together, and not new growths.

This, at all events, is the view now taken by Dr. Shepherd, who, in his *Goulstonian Lectures*, 1877, says, "interstitial, extra-"alveolar growth, is not the commencement "of ordinary consumption; that these growths "play but a slight, and that a secondary, "part in phthisis; and I shall hold, with "authorities equal at least in reputation, if "not in number, to those who support the "contrary, that the pulmonary consumption "of this country consists primarily in intra-

"alveolar changes;" that is the precise view put forward by the author in 1876. And Dr. Shepherd concludes, as he concluded, that giant cells were only ordinary epithelial cells, in another form, and that there is no such thing as a pathognomonic tubercle corpuscle. How these epithelial waste materials accumulate to form infinitely innumerable foreign bodies in the alveoli, irritating surrounding tissue, the author has elsewhere endeavoured to explain. Theory thus vindicates itself as the very backbone of true practice.

These are admittedly abstruse and difficult questions to decide, beyond the ken of laity; yet they are all essentially necessary to be understood before a clear idea can be formed upon the subject; while there cannot be a doubt that their study would be infinitely more profitable, and worthy of calm reflection in scientific society, than perpetual wrangling over the now more than ever undoubted presence of the disease whose natural history they would help to elucidate.

Let us now quite cursorily survey the future prospects of this community in its relation to

phthisis, and estimate the economic value of accurate, intimate, pathological knowledge of the malady, without which, indeed, there can be nothing beyond blind empirical tentative effort, and loose talk about prevention. Such a review is the more needful since phthisis, unlike its congener typhenteric fever, never occurs in such outbreaks as create panics which quickly subside and are soon forgotten, but works away quietly, stealthily, unobtrusively, exciting no deeper emotion than pity for individual suffering, or aversion for objects of trouble and no little inconvenience.

Economists have not determined the money value to the State of every unit in a population. That diseases mainly incident to young people trained in skilled handicrafts interrupt the material well-being of a young colony, daily becomes more evident; and a single instance of the kind may do more to impress upon the commercial mind the industrial bearing of a medical question, than theoretic expositions of the mode in which pathology steps in to explain some relations between capital and labour. Morbid humanity is not

always a mere question of sympathy, to be relegated to doctors, or the back-ground of hospital charity and bad beneficence, with their mock professional dignity and pride of patronage to medical preferment.

At a recent meeting of the Statistical Society of London, in a debate on a paper read by Mr. H. H. Hayter, Government Statist for Victoria, on the general growth of the colony, Mr. William Westgarth spoke to the effect that, "as regarded the extension "of manufactures, he had some doubts whether, "in a semi-tropical climate, it was well to "shut up any large portion of the population "in such close work as most manufactures "involved."

It might in reply be asked, Does indoor labour necessarily involve any morbid condition peculiar to a handicraft? No doubt Mr. Westgarth had in mind phthisis when he made the remark, because it is notoriously the disease *par excellence* of indoor life.

But pathology having no polity, the whole tenor of the argument maintained throughout these pages is to demonstrate that not the

trade or occupation, but the faulty way in which they are too frequently carried on, does harm, in this climate, exactly as in every climate under the sun. Hence, the natural accident of the climate, being semi-tropical, cannot make the colony unsuitable for indoor trades. As well might we contend that, because domestic service, as proved by the records of the Melbourne Hospital, yields as large a proportion to the aggregate phthisical death-rate here as in England, therefore is this climate unfit for that calling.

A like common fallacy about avocation and insanity Dr. Maudsley justly alludes to in the *Pathology of Mind*, 1879, observing: "Whether "one profession, trade, or pursuit more than "another favours the occurrence of insanity "is not really so much a question of the "effect of the particular pursuit as of the "habits of those who follow it, and of the "spirit in which they follow it." But when it is added that the cause of brain and mind degeneration and disease is not, "as it was "long thought to be, a specific morbid entity "which, like some evil spirit, takes hostile

"possession of the body, or of a particular "part of it, and must be expelled by some "specific drug," a very notable error creeps into the reasoning. For if the argument here maintained hold good, as so many facts go to show, the cause of phthisis *is* just such a parasitic invader; and it would be as absurd to call its effect a result of a "greater or less degeneration from healthy "life," as to so describe the irritation of an *acarus* or a *tricophyton*. What may be true enough of *some* brain or mind defect is by too wide a generalisation wrongly applied to every other bodily disease. Phthisical and syphilitic insanity are alike due, each to the pathogenic action of a specific morbid entity, often entering the body when it is in prime health, and setting up through *tubercle* or *gumma* brain-tissue irritation, of which mind alienation is only one symptom—an irritation that can only be cured by removing the cause by "specific" drugs; and in this view the proximate cause of insanity is more directly material than even the structural decay referred to in the latest and

most philosophical exposition of modern, or more properly, of positive psychology.

The following comparison shows the extent of the increase in 1878 over 1877 in the number of deaths from phthisis in Victoria, with the very greatly increased percentage of native born Australians. Whether the increase be going on merely *pari passu* with normal growth of population, or whether it be in excess, remains to be discovered; but it also unquestionably proves that the young people enjoy no immunity. A very large item of increase is in females between 15 and 25 years of age, which may indicate a work-room significance.

The total increase in the whole colony for the year, over last year, is from 1088 to 1124; and of that number the proportion of native born rose, as will be seen on referring to the table at page 14, from 254 in 1877 to 317 in 1878, that is, from 23 to 28 per cent.

About 79 per cent. of the deaths from phthisis of males and 86 of females occurred between the ages of 15 and 55; 5 per cent.

of the males and 8 per cent. of the females died at under 15 years of age, and 16 per cent. of the males and 6 per cent. of the females died at over 55 years of age. These and other particulars may be gleaned from the following table :—

Deaths from Phthisis, 1877-78.—*Age at Death.*

Ages.	Males.		Females.		Total.	
	1877.	1878.	1877.	1878.	1877.	1878.
Under 5 years ...	8	22	10	16	18	38
5 years to 10 years	1	7	6	4	7	11
10 ,, to 15 ,,	6	3	16	17	22	20
15 ,, to 25 ,,	92	107	104	121	196	228
25 ,, to 35 ,,	126	123	119	131	245	254
35 ,, to 45 ,,	149	148	110	109	259	257
45 ,, to 55 ,,	156	122	66	65	222	187
55 ,, to 65 ,,	64	81	29	23	93	104
65 ,, to 75 ,,	12	13	10	5	22	18
75 and upwards ...	2	5	2	2	4	7
Total	616	631	472	493	1088	1124

But a large increase of deaths from phthisis occurred in children under 5 years of age; and it may be made a question whether these were cases of genuine disease, and

not registration errors. Probably, it will be denied that childhood is prone to phthisis, just as it was the other day, in dialectic strategy, denied that infancy was prone to typhoid fever, the doubter forgetting that in Dr. Murchison's nursery occurred the initial cases that unravelled the etiology of the memorable Marylebone typical milk epidemic of 1873. But, to deny to early life phthisis, merely because the anatomical seat of deposit varies from its locality in adult life, is quite untenable. Nay, it may be very confidently asserted that a large proportion of that enormous list of infantile deaths attributed to the ill-defined diseases "atrophy" and "debility," are neither more nor less than deaths due to infantile phthisis. If this be so, the fact would vitiate every conclusion usually drawn from an infantile phthisical death-rate; for, if the disease be differently determined in England and Victoria, the two death-rates cannot be comparable. In the letter of the Government Statist, inserted at page 10, it is doubted if these cases be real; but that is the opinion of a layman

and may or may not agree with general medical experience.

In order to learn more exact particulars about the infantile phthisical death-rate, reference was made to last annual report of the Children's Hospital; but it is only mentioned that 18 deaths occurred from "lung "disease," and 6 from "*debility*," without more precise definition—a record that may suffice for lay business at a charity, but is entirely useless as an aid to scientific inquiry. This remark is the more pertinent since in last number, May 1879, of the *Australian Medical Journal*, an editorial note intimates that "it is "the conviction of those who know most of the "records of this"—the Registrar-General's— "office, that the certificates of death sent in "by medical men are, to a large extent, un- "reliable, from the obviously unscientific man- "ner in which they are furnished;" and to ensure accuracy, proposes a thorough reform, that would have to begin with our metropolitan hospitals. At the same time, as the *Report* upon phthisis was adopted by the Medical Society, because—"Based as it is

upon carefully prepared statistics,"[1] obtained direct from the Registrar-General, if it really can "enable the profession to form tolerably correct opinions upon this important question" of the prevalence of phthisis, and was indeed "complete and comprehensive,"[2] its utility entirely depended on the fidelity and accuracy with which legally qualified medical men, who alone give death certificates, fulfil their onerous public obligation. If their certificates were accepted as authentic then, they cannot consistently be rejected as unauthentic now, merely because argument based upon them goes against a particular theory. Besides, it is well known that for some time great care has been taken at the Registrar-General's office, in referring back all certificates of death that were dubiously worded, so as to have them made more exact.

The slur thus vaguely thrown on a whole body of medical men is not sustained by a single instance of misfeasance, and is probably of no logical value.

[1] President's Address, January, 1878.

[2] *The Argus*, 6th December, 1877.

Therefore, without pledging the complete accuracy of every item, the average is accepted as trustworthy. And in order to show the prominent player is a death-rate by phthisis and atrophy, the following table is appended :—

List of the most prevalent diseases in Victoria, arranged in order of fatality, according to the total number of deaths occurring from each during the 25 *years, ending in* 1878.

	NUMBER OF DEATHS.
Phthisis	19·635
Atrophy	18·248
Diarrhœa	17·016
Dysentery	12·246
Pneumonia ...	10·316
Typhoid	10·608
Circulatory ...	9·629
Scarlatina	8·570
Bronchitis	7·611

To the above table it is unnecessary to add a word more than that the rate for atrophy in proportion to the general death-rate, equals, if it does not exceed, the rate in England from the same disease of nutrition,

a fact that either says little for our boasted improved circumstances of life and method of feeding infants and young children, by a people who are in the daily habit of going to the grocers for their physic, and to the druggists for their infant's food, or speaks a great deal for a class of diseases of which the Government Statist remarks:—

"Large numbers of deaths of young "children are each year set down under "this head, frequently no doubt from want "of better information respecting the primary "diseases. It is much to be desired that, "where possible, medical men would define "these deaths more accurately."

The infantile phthisis increase in 1878 could hardly be alone due to atrophy misnamed, because in 1877 and 1878 the number of deaths therefrom was nearly the same, though more might have been looked for with growing population. That it was indeed phthisis is probable, since the total number of deaths from atrophy, tabes mesenterica, and infantile phthisis simultaneously increased in greater or less degree, thus:

Ages.	Atrophy.		Tabes Mesenterica.		Infantile Phthisis.	
	Year.		Year.		Year.	
	1877.	1878.	1877.	1878.	1877.	1878.
1 to 5 years	59	60	23	29	12	18

However, to restrict discussion to young adults just entering upon the bread earning period of life, is the point to which the reader's attention is now more particularly directed. The point merits careful inquiry, because it formed the critical difficulty which many people could not get over without assuming what a glance at exact figures shows did not exist; and also because it may now form the basis for legislative interference with factory life and the working time of young female adults. In the following table will be seen how the rates have risen in the age-periods 15 to 25, and 25 to 35, and declined from 35 to 45, and 45 to 55, clearly enough proving the vulnerability of the young people of the colony.

Number of Deaths from Phthisis in Victoria, in 1877 *and* 1878, *between the ages of* 15 *and* 55, *in four terms, showing the increase in the two first, and the decrease in the two latter age periods.*

Ages.	Deaths from Phthisis in 1877.	Deaths from Phthisis in 1878.	Difference.
15—25 ...	196	228	+ 32
25—35 ...	245	254	+ 9
35—45 ...	259	257	- 2
45—55 ...	222	187	- 35

Here, then, with marked falling off in deaths from phthisis at the older ages, there were between the active ages of 15 and 35, in 1877, 441 deaths from phthisis, and in 1878, 482, being 41 in the latter more than in the former year. In the two years, the total deaths from phthisis at these work-room ages were 923.

They cannot have been all of invalids from other countries swelling the list; but were mostly of residents, however their complaint was got. This becomes quite evident by the numbers in the following table, showing how comparatively few of the deaths occurred in

persons who had been less than 5 years in the colony.

Deaths from Phthisis, 1876, 1877, *and* 1878.—*Period of Residence in Australasia.*

Period of Residence in Australasian Colonies.	Numbers who Died from Phthisis.				
	1876.	1877.	1878.	Total in Three Years.	Proportion per cent.
Under 1 month ...	6	4	8	18	0·60
1 month to 1 year	25	20	23	68	2·26
1 year to 2 years ...	18	11	11	40	1·33
2 years to 5 years	33	39	40	112	3·73
5 years and upwards	672	682	649	2003	66·70
Born there ...	193	252	317	762	25·37
Total	947	1008	1048	3003	100·00

It will be seen that out of the 3003 of whom particulars could be obtained, who died of phthisis in Victoria during 1876, 1877, and 1878, 762, or 25·37 per cent., were born in Australasia; that 2003, or 66·70 per cent., more had resided there for upwards of five years; that 112, or a further 3·73 per cent., had lived there for upwards of two years;

and that only 126, or about 4 per cent., had lived there for less than two years.

The census of 1871 disclosed a marked increase in deaths from phthisis at ages from 15 to 35. This unlooked for excess of the malady in the latest fashionable health resort, after two decades of ripe experience, rather staggered certain theorists, whose gain was endangered unless they succeeded in connecting so unpropitious a result with the operation of some peculiar influence not climatic. Therefore, the so-called "apparent" but very real increase was apologetically ascribed to an undue influx of too hopeful incurables who had been attracted hither by glowing tales about a health paradise, with a capital, which if not exactly the much desiderated City of Hygieia, was at least by report of those who claimed to be experts pronounced "the best place in the world, "at all seasons, for consumptives, in every "stage of the disease." The influx of pilgrims, whose faith was disenchanted by reality, only served to offer "a possible "explanation of what would otherwise be an

"inexplicable anomaly," to minds imbued with a belief that phthisis could not propagate itself in warm, dry, balmy, ozony air; but if ever there met with, would only be found among tubercular lungs diseased before arrival. The proof of this was indeed said to have been "brought out in a table "in the *Victorian Year Book* for 1876 "(page 75), where it is shown that of 49 "persons (40 males and 9 females) dying "of phthisis in Victoria within two years "(31 of them within one year), after their "arrival in the Australian colonies, 42 were "between 15 and 35 years of age, with the "probability that they were almost all "above 20."

But while 49 phthisical immigrants died within two years after coming to the colony to live, 198 (96 males and 102 females) at the same ages died after living there over two years—indeed, many over five, most even over ten years—that is, longer than the ascertained duration of their illness, which must consequently have begun in the colony. In addition to these, 151 (70 males

and 81 females) dying of phthisis at those ages had actually been born in the country.

To set against 49 new comers whose untimely deaths were held to argue injustice done to an injured climate, were 349 (198 old residents and 151 natives) of whom nothing was said. Sophistry can "prove anything by figures" if you allow it to square stubborn facts in this way. But the thing so "proved" cannot be approved as in harmony with scientific or any other sort of truth—the "fair round dealing which is the honour of human nature," as well as the only promoter of medical science. The semblance of proof affords a short-lived triumph, which is after all a sorry sort of utility. A mere fractional part of the cited table at page 75 in the *Victorian Year Book* 1876-7 was reproduced, the remainder of the formula being overlaid by a gloss on the text criticised.

To restore the table the following figures are now collated; and beside them are placed corresponding figures for 1878, for comparison.

Return showing the Period of Residence in Australasian Colonies of Persons Dying in Victoria, between the Ages of 15 and 35 years, in 1876 and 1878.

Period of Residence in Australasian Colonies.	1876.				1878.			
	Age at Death.				Age at Death.			
	Males.		Females.		Males.		Females.	
	15 to 25.	25 to 35.	15 to 25.	25 to 35.	15 to 25.	25 to 35.	15 to 25.	25 to 35.
Under 1 month	2	3	...	...	2	3	...	...
1 month to 6 months	5	5	...	4	5	5	...	...
6 months to 12 months	3	3	...	...	6	2	1	...
1 year to 2 years	4	8	2	3	5	2	1	1
2 years to 3 ,,	3	4	...	2	3	4	...	...
3 ,, 4 ,,	2	3	1	...	2	9	...	3
4 ,, 5 ,,	1	4	...	2	2	4	1	2
5 ,, 10 ,,	1	16	5	8	3	14	3	13
10 ,, 15 ,,	4	17	7	18	1	11	3	21
15 ,, 20 ,,	5	12	5	18	5	9	1	17
20 ,, 25 ,,	3	16	6	17	3	18	4	19
25 ,, and upwards	...	5	1	12	...	4	...	15
Not known (not Australians)	1	3	...	1	...	5	...	2
Born here	51	19	66	15	69	27	106	29
Not known (no information respecting birthplace)	3	2	1	5	2	5	3	7
Total	88	120	94	105	108	122	123	129

From these figures it will be seen that more phthisical males than females appear to have sought a sanatorium in Victoria; for in two years 44 males died after less than a year's residence, and only 5 females. This agrees with experience in private practice, the only opportunity of knowing the numbers coming over and above the recorded number of fatal cases.

But amongst other residents and native born, deaths from phthisis of females preponderate. The difference may be partly due to the proclivity to phthisis of domestic servants, a liability doubtless owing to the frequency with which young girls fresh from open air country life are in their daily household work brought into contact with infective particles thrown off from ulcerating lungs affected with the specific malady—particles all the more deadly because unheeded, or deemed innocuous and therefore never dreaded. Not that ordinary domestics are occupied nursing or tending invalids; but cleaning bedrooms and consequent inhaling dust of dried sputa must obviously be a

daily occurrence. In such young women phthisis is commonly attributed to cold, or badly ventilated dank sleeping rooms, but seldom or never to the really potent agent, direct contagion. No effort is ever made to intercept infective particles from phthisical sputa floating in the air along with ordinary dust, or to ensure their chemical destruction. Indeed, he would be talked about as a fussy enthusiast who would propose to do anything so pragmatically absurd, and might even be shunned in practice for his prodigious nonsense.

And yet, if any sceptical reader doubt the excessive fatality from phthisis among the class referred to, hospital records will amply satisfy curiosity.

It will not often greatly avail to interrogate sufferers themselves, for they indeed, can rarely tell, and seldom do they even guess, where they caught contagion; many, indeed, hardly entertain a lurking suspicion, so insidious is the virus, and long latent ere it excite attention in the earlier phases of the affection.

The following figures afford adequate proof of the accuracy of these statements regarding the numbers in hospital:—

Melbourne Hospital, 6th June, 1879.

Memorandum of Women treated for Phthisis during the years 1877-1878.

Domestics, married	95
,, single	78
Machinists ,, ...	2
Tailoresses ,, ...	2
Laundresses ,, ...	6
Seamstresses ,, ...	7
Barmaids ,, ...	2
	192

Of 248 phthisical females admitted in two years into the Melbourne Hospital, the occupations of 192 are known, leaving 56 undetermined. Of the 192, only 19 worked at handicrafts deemed active in causing lung disease, and 173 domestics. Even if the 78 single women were alone admitted as domestic servants proper, and the 95 married women excluded—though they likewise often clean up after invalid lodgers—the number would be enough to settle the question. For, if

the thousands of female machinists, girls working in factories under careful hygienic supervision, only gave 2 cases of phthisis to the metropolitan hospital, why should the infinitely smaller number of seamstresses, not under any regulating control, send 7 cases? or single domestic servants 78? or single and married together 192?

It may perhaps be replied that domestic servants are generally friendless, or without relatives in town to whom to go for aid in sickness, while machinists and factory hands are nearer home; and though there may be truth in the remark, still, the difference of social circumstance can hardly, one would think, be great enough to fully account for the immense disparity. The point could only be determined by finding the occupation of the deceased in every death from phthisis, in some way similar to that begun in the *Digest*, &c., 1871.

But it seems undeniable that, as far as they at present go, the facts adduced make the argument formerly advanced in the essay *On Phthisis*, 1870, assume the form of

verified inference; and show how "things "will never be done in act except they be "first done in conceit." These facts are theory reduced to practice. At all events, they altogether negative the foregone idea that factory life cannot be regulated so as to enable artisans to work in-door in this or in any climate, without of necessity incurring danger of inducing phthisis.

The difference between an ordinary factory, or work-room, with an atmosphere of common air, and such a place as a tobacco factory, with its air highly medicated, either by nicotine in fume or impalpable dust, alone or in conjunction with other derivatives from the narcotic weed—parvoline, pyridine, and ammonium compounds, that are, however, rather present in burnt tobacco smoke, and results of combustion, appears to be simply this, that if workers in the former be exposed to the specific contagion of parasites they may be infected; whereas in the peculiarly medicated air of the latter, contagion from no sort of animal or vegetable parasitic organism, external or internal, will ever take effect.

This may perhaps be further illustrated by the action of sea air on phthisical lungs in sea voyaging. That this air checks early phthisis is very generally allowed; but whether it act through abundant free oxygen, or by particular medicinal ingredients contained in that air, is not clearly known. To bromine and iodine continuously inhaled in natural combination along with saline particles, in however minute quantity, the effect may be partly due, since these elements are peculiarly inimical to land animal parasitic life in every variety and form. Sea air would thus rank, *re* phthisis, as a specially medicated atmosphere, call it climatic, or what you will.

It cannot be said air on the open ocean is not known to contain bromine and iodine, or that air near the sea shore may not derive both from decayed sea weed; but only, that these elements do not appear to destroy parasites on marine animals. The subject has as yet received but little attention. The former is not a difficulty, neither the latter; for it does not follow that what kills one species must be equally fatal to every other living in

the same medium. Thus, for example, while soda salt is obnoxious to liver fluke, it is quite an essential for the life of the hydatid, which, by the way, bromine and iodine readily kill, as they kill struma and syphilide organisms. Fluke cannot exist in an animal full fed on common salt; while hydatids can no more subsist without it, the fluid contents of the cyst in which the parasites thrive and multiply being a strong saline solution.

Both are often erroneously held to be allied species in nature and origin; while the natural history of all these parasites supplies an admirable analogy for deduction in the etiology of phthisis.

Moreover, the keener effect of bromine and iodine in natural over artificial combination is of great significance in relation to the curative action of sea air in phthisis. The greater efficacy of nature's combinations was long ago pointed out in Bacon's earlier writings; and the same principle has lately been revived as a novelty in connection with the superiority of native over artificial mineral water.

Whether factory life be otherwise antagonistic to inherent vigour; or rather tend to leave the physical frame undeveloped, little robust, or even diminutive, with "subtle "brains and lissom fingers," are entirely different questions, in viewing which it may be well to warily refrain from offering direct advice that the ardent *amour propre* of a proud young colony might deem invidious, or which might, forsooth, be indignantly denounced as "disparaging slanders" by medical mentors, flattering or heroic, who cling to belief in the tory maxim "the "greater the truth the greater the libel."

One ancient sage cautioned well-meaning would-be social reformers that "In all human "governments, those who are at the helm "can introduce what they desire for the "good of the people more successfully by "pretext and indirect ways than directly;" or, as a contemporary poet said:—

"And thus do we of wisdom and of reach,
"By indirections find directions out,"

adding,

"And that's not suddenly to be perform'd,
"But with advice and silent secrecy."

Whichever mode, direct or suggestive, be adopted, some action is urgently required for regulating crowded work rooms too often in unfit places; an affair, however, to which we here can do no more than allude. But in immediate relation to the argument on the non-modifying power of climate, one plea deserves passing remark, to show how trade would utilise physiology.

It has been urged that early development of the female system is peculiar to this climate, fitting young girls for all the functions of grown matrons. This is probably another outcome of inveterately ingrained medico-popular error. Such monstrosities of prematurity are occasionally met with in all climates; but the statement that it is common in this colony is unsupported by experience. Anyone acting on such a belief in a precocious maturity will be entirely mistaken, and may do great harm, particularly if, as is threatened, the erroneous belief be made a basis for legislation on privileged or enforced toil. The tissues of youth have here as everywhere the same plastic nature,

and, if too heavily taxed suffer injury; for when any imaginary prematurity is taken advantage of, the invariable result is broken health. If the plea be urged unwittingly, it is well corrected; if knowingly, it shows how cupidity dulls the moral sense.

Reverting for a moment to the argument derived from the number of phthisical cases among natives admitted to hospital, it may be here mentioned that while formerly data later than 1874 could not be had, they now are obtained down to 1878, and show that the proportion has only increased in the last four years to 15 per cent. in hospital cases, whereas the general phthisis death rate among natives in Melbourne and suburbs has risen to 33 per cent. in 1878; clearly proving that the majority of fatal cases of phthisis were not drawn from the country to be treated in hospitals, but were treated at the patients' own homes.

Again, to show this hospital ratio, the following extension of the original table is now given in continuation of that at page 22 :—

MELBOURNE HOSPITAL.

Return of the number of Cases of Phthisis among Victorian and other Australians, during the years 1875-76-77-78.

Year.	Natives of Victoria.		Natives of other Australian Colonies.		Total Natives of Australia.	
	Number of Cases, fatal and non-fatal.	Number of Deaths.	Number of Cases, fatal and non-fatal.	Number of Deaths.	Number of Cases, fatal and non-fatal.	Number of Deaths.
1875	31	14	5	3	36	17
1876	22	9	8	4	30	13
1877	33	16	16	8	49	24
1878	33	12	14	5	47	17
	119	51	43	20	162	71

The total number of deaths from phthisis during the four years being 470, the 71 deaths among the Australian born is about 15 per cent.

There is already given at page 97 in tabular form the number who died of phthisis in Victoria, at different ages, in 1878. The following addition to that list, showing the relative numbers of deaths in Melbourne and suburbs, deducted from the total number in Victoria, will be found suggestive:

Number of Deaths from Phthisis in Melbourne and Suburbs, in 1878, *at different ages.*

Ages.	Males.	Females.	Total.
Under 5 years	16	9	25
5 to 10 ,,	2	3	5
10 ,, 15 ,,	2	4	6
15 ,, 25 ,,	70	66	136
25 ,, 35 ,,	76	75	151
35 ,, 45 ,,	55	72	127
45 ,, 55 ,,	42	38	80
55 ,, 65 ,,	29	12	41
65 ,, 75 ,,	3	3	6
75 and above	3	...	3
All ages—Total	298	282	580

Of the small number of deaths from phthisis between 5 and 15 years of age, an explanation is given at page 76, where the circumstance is also shown to be no way peculiar to this colony.

By comparing these numbers with figures on page 97, it will be seen that in 1878, of all deaths from phthisis in Victoria, 36 more occurred in town than in the rest of the colony; that 35 more males died in

the country than in town; but that 71 more females died in town than in the country. How far these fatal cases relate to the distribution of the sexes in urban and rural populations, or what they imply as to effect of occupation, is hard to say. As remarkable are the many dead domestics, among whom, by the way, will rarely be found any Jewish people, who never enter Christian tents, and seldom die from phthisis. Their exemption may be racial or hereditary, due to habits of life, or non-exposure to direct contagion, every doubt involving a new etiological problem, and greater need for microscopic scrutiny of the causes of disease.

In a very recent *Government Gazette* appear these censuring words :—"It seems dis- "creditable that, in the absence of any "particular epidemic, so fine a city as "Melbourne should have so high a propor- "tion from zymotic diseases"—in 1878 nearly 27 per cent., against less than 21 per cent., in London, in 1876. While bewailing this fatality, so "discreditable," from acute specific contagious fevers, chief

among them being perennial typhoid, the 60 deaths from phthisis in a total of 483 deaths from all causes occurring in that same month, evoked no official commentary. Phthisis fatality has evidently grown too familiar to call forth particular remark, or even arrest momentary attention.

Amid dire indifference to the steady progress of the most fell disease in Victoria, it may be vain to try to determine a pathological problem, which, if medically settled, would be an honor to "the higher physicians," and an incalculable benefit for the community.

END

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TYPHOID FEVER IN MELBOURNE IN 1878.

The greater part of the following additional observations on the extent of Typhoid Fever in Melbourne and its suburbs, in 1878, appeared in the form of letters in *The Argus*, at dates later than the publication of the *Report* :—

Considerable misapprehension appears to prevail as to the average death-rate from typhoid fever in Melbourne and its suburbs. Thus, the report of the local health officer of Hotham, for 1878, shows that in a population of 15,500 there were during the year nine deaths from that disease. This number is at the rate of six deaths for every 10,000 persons living—a very high mortality, equalling the very worst towns in Great Britain, and yet withal the local board of health were congratulated on the healthy state of their town! No doubt the general mortality was low: 16½ per 10,000, owing, probably, to the absence of any unusual epidemic; but the diseases that did occur, and were ordinarily present, such as the one mentioned, would appear to have been severe.

Again, in a pamphlet lately published from the text of a lecture to a mixed audience at the Australian Health Society, on *Diseases that Should be Prevented*,

the author says, "The number of deaths from typhoid "in Melbourne is not very excessive, amounting to "about 160 in the year." The following, however, are the exact numbers, distributed in two five-year periods, as supplied to me at the Government Statist's office :—

Year.	Deaths.	Year.	Deaths.
1869	116	1874	216
1870	171	1875	200
1871	126	1876	160
1872	112	1877	249
1873	115	1878	307
Total ...	640	Total ...	1132
Yearly average	128	Yearly average	226·4

For the five years ending in 1873, the average annual rate was 128; while for the last five years, ending with 1878, the average annual rate was 226·4. The author of the pamphlet would appear to have taken the least number in the latter period, viz., 160, and adopted it as an average, which greatly understates the case. It cannot even be shown that any increase of population would be at all commensurate with the vast difference between the two given five-year periods.

The jump from 115 in 1873, to 216 in 1874, justifies all said by me, in my original *Report*, about the severity of the fever in 1874, and quite disproves the opinion of the Central Board of Health, that the cases were never very many, nor "widely disseminated."

In 1878 the deaths from typhoid fever in Melbourne and suburbs numbered 307, which in a population of 251,000, estimated, gives 12·23 deaths from this fever for every 10,000 persons living, a rate far exceeding that in any town in Great Britain, except when taken at their

very worst local epidemic outbreaks. The rate for the previous year, 1877, was as high as 10 for every 10,000 living, so that the year 1878 was only a degree higher, and indicating a steadily increasing high average, the extent of which it would be difficult to exaggerate, the truth being bad enough.

Aware that 1878 had been the worst year ever known in Melbourne for typhoid fever, when it was stated in the annual report of the local medical health officer for Hotham that, with a population of 16,000, only nine deaths from typhoid occurred there during 1878, it seemed to me that if the reason for the marked immunity could be found it might give a clue to the cause so active in other localities.

On going about inquiry, the first thing to be done was to verify the number stated. At the Melbourne Hospital I learned that eight deaths from typhoid had been of persons sent in from Hotham. These were registered in South Melbourne, but were really due to Hotham, and would, if added to its nine, give seventeen in all for that place. If these deaths be not so relegated, then the central district would show 56 deaths, which, in its 20,000 inhabitants, would yield 28 deaths from typhoid in every 10,000 living, although the district is in reality far lower in the typhoid fatality than many outlying divisions.

After finding this oversight, it appeared desirable to further verify the Hotham return, and on applying for the purpose to the Registrar-General, Mr. Richard Gibbs, that gentleman kindly and promptly caused to be prepared for me a complete tabulated list of all recorded deaths from typhoid fever, entered under the varied synonyms of enteric, gastric, infantile remittent, low, and typhoid fever, by which I find there were in Hotham for 1878 no fewer than 23 deaths registered instead of 9, as stated.

Added to this 23 ought to be the 8 occurring in hospital, making a total of 31 deaths for the year. In the 16,000 of population the 31 gives 19 to every 10,000 living, a rate never equalled, nor, indeed, nearly approached, in any town in Great Britain, even during the worst epidemics.

The discrepancy between the actual number and that published by authority is so great as to form a perfectly unaccountable anomaly.

The large majority of those deaths were among adults between 20 and 30 years of age.

It would almost appear as if there were some craze abroad to make Melbourne out a more salubrious town than it is in reality. What with a local health officer declaring there were only 9 where there were 31 deaths, representing not 90, but 310 cases of fever; a medical lecturer to the Australian Health Society glibly telling his audience that "typhoid fever is never very excessive, "only causing about 160 deaths a year," when the yearly average is over 226, giving 2260 cases; and a Central Board of Health reporting "the number of cases of "typhoid fever never very great," one is apt to doubt if authorities know what forms a relatively high or a low fever rate.

In estimating the extent of typhoid fever by its fatality, the only means available in the absence of a general record of zymotic disease, it is necessary to arrange separately metropolitan registration returns; for though it may in a way be enough to know that the very high rate of over 12 deaths in every 10,000 living occurred in Melbourne and suburbs in 1878, yet it would be more exact, and might lead to closer scrutiny of supposed causes, to learn the number every district contributed to the aggregate, particularly when some of the districts are from four to ten miles apart.

The following table shows the chief centres of fever, omitting places such as Brighton and Heidelberg, where no deaths were recorded; and others, such as Northcote, Brunswick, Kew, Coburg, Hawthorn, South Yarra, &c., with only from one to six deaths each. In these localities non-fatal cases also occurred, but note of them cannot be taken in calculating the degree of prevalence of fever by its known fatality.

Number of Deaths from Typhoid Fever to every 10,000 Living in the Undermentioned Districts of Melbourne in 1878, with Corresponding Numbers for Towns in England and Scotland for Comparison.

——	Mean Population.	Deaths from Typhoid Fever.	Number to every 10,000 Living.
Hotham	15,173	32	21·09
Carlton	25,882	44	17·00
South Melbourne (ex. Hospital)	19,669	32	16·27
Sandridge	7,900	11	13·92
Collingwood	22,000	30	13·63
St. Kilda	10,000	12	12·00
Emerald Hill	25,000	27	10·80
West Melbourne	17,000	14	8·24
Richmond	20,153	15	7·44
Fitzroy	19,160	13	6·78
Prahran (ex. Hospital) ...	19,200	11	5·73
London	...	...	2·60
Croydon	...	...	5·90
Glasgow	...	...	4·90
Paisley	...	...	5·30

The data for the table were kindly supplied by the Registrar-General, Mr. Gibbs; Mr. Williams, of the Melbourne Hospital; and Mr. Anderson, of the Alfred Hospital. The information enables us to refer fatal hospital cases to their respective localities where illness began. The Alfred Hospital, like the Melbourne Hospital,

is in South Melbourne district, but its twenty deaths from typhoid were registered at Prahran, though in only three of these deaths had the patients been received from that town, seventeen of them having come from other localities, St. Kilda sending five, Melbourne three, and fever-rife Hotham one.

The population numbers are the estimated mean for 1878, supplied by the several municipal bodies to the Government Statist for the purposes of the forthcoming *Victorian Year Book*.

The numbers for the named English and Scottish towns are taken from the thirty-ninth annual report of the Registrar-General, from Mr. Baldwin Latham's *Sanitary Engineering* 1878, and from Dr. J. B. Russell's paper in the *Proceedings of the Glasgow Philosophical Society* 1878.

At Croydon typhoid fever has been very much higher (16 in 10,000, 1875) within the area of a typhoid-poisoned water service, and as high as 10 in 10,000 in one Glasgow locality during a severe outbreak caused by wholesale typhoid milk-poisoning; but in none of the worst places or times did typhoid fatality ever equal these Melbourne districts. Even the whole fever rate, including both typhus and typhoid, at Croydon, London, Bristol, or Plymouth, is only from 6 to 7 per 10,000, or about half that of our typhoid alone in 1878.

Here, then, was a death-rate from typhoid fever more than treble that given out by the local health officer; a rate so high that it has never once been equalled in any town in Great Britain, not even at Croydon, during a memorable epidemic caused by wholesale typhoid virus poisoning of the drinking water. That epidemic threw the whole country into a state of alarm and panic, evoking the most vigorous efforts to control it; but here, on the contrary, not only has the great fatality of 1878 passed

unnoticed by any publicist, but central and local boards of health and popular lecturers on public hygiene, freely congratulate one another on their typhoid fever immunity, and placidly proclaim that there never was the slightest reason for an "exaggerator" to disturb the general equanimity. The public read often enough of dire plagues at foreign parts, but hardly a word of the perennial fever at their own townsteads.

This retrospect of the past, without reference to present or future fever, shows that if people had been better advised they might have avoided the 1878 fatality, which is undoubtedly due to neglected laws of contagion. For Hotham, naturally well drained, probably lets fever discharges fall about the many rough drains that run all over its undulating site, where the typhoid virus dries into dust, to return air-borne in summer to affect the inhabitants.

To enable the people of Melbourne to lessen this very high mortality from an easily-controllable fever, they require to be informed on its causation, to erroneous views on which, and a corresponding irrational practice, is entirely due the ruling excess.

It is, therefore, gratifying to find stress laid on this point by the author of the pamphlet alluded to, the more so as the work has been reprinted, with editorial eulogy, and approval of its tenets, in the *Australian Medical Journal* for September 1878, while the text was originally read as a lecture before the Australian Health Society—an influential body of citizens, educating the public in sanitary work; and, therefore, making it all-important that they should be themselves instructed in sound scientific principles.

The words particularly referred to in the lecture are:—
"In the case of typhoid fever, more than any other
"epidemic, might good results be expected to follow.

"It has been established that that disease is propagated "by means of the stools of persons suffering from it. "By them the soil or water is contaminated, and by "emanations from the soil, or from cesspits or drains, "or by the use of water, milk, &c., so contaminated, "healthy persons are affected. From my own observa- "tion I know that very often such discharges are simply "thrown into the gutter, to find their way no one knows "whither, but certainly often enough to cause the "occurrence of new cases."

This is the identical proposition so often brought by me before Melbourne citizens; and, moreover, it is stated in almost my own oft-repeated words. It is the theory of contagion enounced by a new advocate. The theory evidently grows in professional favour, and the reflective popular mind may look hopefully forward to clearer ideas of a rational etiology, and as an outcome, of a more effective preventive method.

By the light of these facts the sanitary section of the forthcoming Social Science Congress will be enabled to study the etiology of Typhoid Fever in one of the worst localities in the world for that disease.

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